PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-323499
(43)Date of publication of application : 08.11.2002

(51)Int.Cl. G01N 33/574

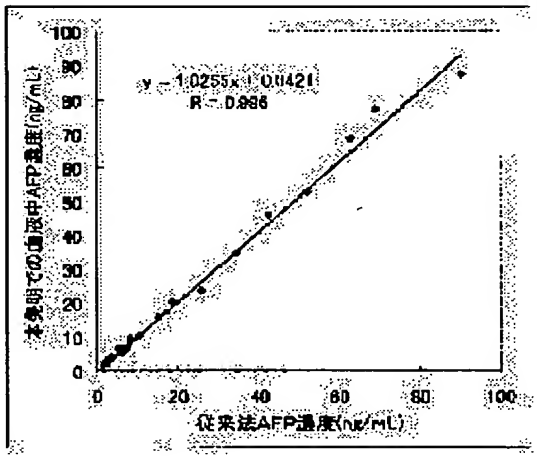
(21)Application number : 2002-035154
(22)Date of filing : 13.02.2002

(71)Applicant : SANYO CHEM IND LTD
(72)Inventor : KUNICHIKA MAKOTO

(30)Priority
Priority number : 2001046448 Priority date : 22.02.2001 Priority country : JP

(54) METHOD FOR DETERMINING TUMOR MARKER IN BLOOD

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a method for easily determining a tumor marker for cancer of a digestive system and a tumor marker for hepatoma.
SOLUTION: In the method for determining the tumor markers in blood, a blood component is extracted from a blood-carried carrier, and the tumor marker for cancer of a digestive system and/or the tumor marker for hepatoma are determined from the extracted blood component. The tumor markers are preferably tumor markers for colorectal cancer, biliary cancer, pancreatic cancer, and/or hepatoma and further preferably a carcinoembryonic antigen(CEA), α-fetoprotein(AFP), and/or CA19-9. It is preferable that the blood-carried carrier is formed by making an absorber using filter paper carry blood, and it is further preferable that the blood-carried carrier is formed by making the absorber carry blood collected from a finger tip.



LEGAL STATUS

[Date of request for examination] 08.05.2002
[Date of sending the examiner's decision of rejection]
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number] 3579032
[Date of registration] 23.07.2004
[Number of appeal against examiner's decision of rejection]
[Date of requesting appeal against examiner's decision

of rejection]
[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The tumor marker quantum approach in the blood characterized by extracting a constituent of blood from blood support support, and carrying out the quantum of the tumor marker of the digestive system cancer in blood, and/or the tumor marker of hepatic carcinoma from this extract constituent of blood.
[Claim 2] The tumor marker quantum approach in the blood according to claim 1 whose tumor marker is a tumor marker of colon cancer, a gall bladder cancer, a pancreatic cancer, and/or hepatic carcinoma.
[Claim 3] The tumor marker quantum approach in the blood according to claim 1 or 2 whose tumor markers are a carcinoembryonic antigen (CEA), alpha fetoprotein (AFP), and/or CA 19-9.
[Claim 4] The tumor marker quantum approach in blood given in any of claims 1-3 by which blood support support comes to support blood to the absorber which comes to use a filter paper they are.
[Claim 5] The tumor marker quantum approach in blood given in any of claims 1-4 by which blood support support comes to support the blood extracted from the fingertip they are.
[Claim 6] The tumor marker quantum approach in blood given in any of claims 1-5 which determine the tumor marker concentration in an extract, and the tumor marker concentration in [the extractability of a constituent of blood to] blood they are.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the tumor marker quantum approach in blood. It is related with the tumor marker quantum approach in the blood used for a diagnosis of digestive system cancer and hepatic carcinoma in more detail.
[0002]
[Description of the Prior Art] The syringe for blood collecting is conventionally used as the quantum approach of the tumor marker of digestive system cancer and hepatic carcinoma. After extracting 2 or more mLs of whole blood and mainly putting at a room temperature from a patient's elbow culmination vein for 1 hour or more, Cooling centrifugal is carried out for 1500 G or 10 minutes with a refrigerated centrifuge, a blood serum part and a clot part are divided, a supernatant liquid (blood serum) part is isolated preparatively in another test tube, and the approach of making this a measurement specimen and carrying out a quantum etc. is learned (for example, a clinical laboratory test manual, 1988, ******, 311-316 pages). In order to further usually measure efficiently, the approach of freezing or refrigeration saving a measurement specimen and carrying out the quantum of the measurement specimen of a constant rate collectively etc. is learned (for example, immunoassay, 1984, JIEI em C, 173-174 pages).
[0003]
[Problem(s) to be Solved by the Invention] There was a problem to which cost -- actuation of separating supernatant liquid from much blood when collecting blood from many subject and measuring the tumor marker in blood, such as a medical checkup, is required in the conventional approach, and there is the need of conveying and saving the separated blood serum by refrigeration or refrigeration with a test tube -- becomes high. That is, the object of this invention is offering the approach of carrying out the quantum of the tumor marker of digestive system cancer, and the tumor marker of hepatic carcinoma simply.
[0004]
[Means for Solving the Problem] As a result of inquiring wholeheartedly that the above-mentioned object should be attained, by using a specific approach, this invention person found out that the quantum of the tumor marker of digestive system cancer and the tumor marker of hepatic carcinoma could be carried out simply, and reached this invention. That is, this invention is the tumor marker quantum approach in the blood characterized by extracting a constituent of blood from blood support support, and carrying out the quantum of the tumor marker of the digestive system cancer in blood, or the tumor marker of hepatic carcinoma from this extract constituent of blood.
[0005]
[The gestalt of invention implementation] The tumor marker (antigen) in this invention is a tumor marker for diagnosing digestive system cancer and/or hepatic carcinoma. As digestive system cancer, an esophagus cancer, gastric cancer, duodenal cancer, small intestinal cancer, colon cancer, rectal cancer, a pancreatic cancer, a gall bladder cancer, etc. are mentioned. It is duodenal cancer, small intestinal cancer, colon cancer, rectal cancer, a pancreatic cancer, and a gall bladder cancer preferably among these, and is colon cancer, rectal cancer, a pancreatic cancer, and a gall bladder cancer still more preferably, and they are colon cancer, a pancreatic cancer, and a gall bladder cancer especially preferably.
[0006] As a tumor marker of digestive system cancer, the following are mentioned, for example. In the case of an esophagus cancer, they are a carcinoembryonic antigen (CEA), IAP, ferritin, polyamine, beta 2-microglobulin, POA, a trypsin inhibitor, etc. In the case of gastric cancer, they are alpha fetoprotein (AFP), CEA and CA 19-9,

KMO-1, DuPAN-2, SPan-1, CA50, SLX and CA 72-4, IAP and TPA, polyamine, beta 2-microglobulin, ferritin, POA, a trypsin inhibitor, etc. In the case of duodenal cancer, small intestinal cancer, colon cancer, and rectal cancer, they are CEA, CA 19-9, KMO-1, SPan-1, CA50, SLX and CA 72-4, IAP and TPA, beta 2-microglobulin, ferritin, POA, a trypsin inhibitor, etc.

[0007] In the case of a gall bladder cancer, they are AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, CA50 and CA 72-4, basic fetoprotein (BFP), NCC-ST -439, IAP and TPA, beta 2-microglobulin, ferritin, PIVKA-II, POA, a trypsin inhibitor, etc. In the case of a pancreatic cancer, they are CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, CA50 and CA 72-4, BFP, IAP and TPA, beta 2-microglobulin, ferritin, POA, a trypsin inhibitor, elastase 1, etc.

[0008] As a tumor marker of hepatic carcinoma, AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, CA50 and SLX, basic fetoprotein (BFP), NCC-ST -439, an alkaline phosphatase isozyme, a gamma-glutamyl transpeptidase isozyme, IAP and TPA, beta 2-microglobulin, ferritin, PIVKA-II, POA, a trypsin inhibitor, etc. are mentioned, for example. Among these tumor markers, preferably AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, SLX, CA50, CA 72-4, BFP, IAP and TPA, beta 2-microglobulin, They are ferritin, POA, a trypsin inhibitor, elastase 1, and PIVKA-II. It is AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, SLX and CA 72-4, BFP, IAP, TPA and POA, and PIVKA-II still more preferably, and they are AFP, CEA, and CA 19-9 especially preferably.

[0009] In the quantum approach of the tumor marker in the blood of this invention, although the quantum of one sort of tumor markers may be carried out and the quantum of two or more sorts of tumor markers may be carried out, carrying out the quantum of two or more sorts of tumor markers from the sensibility of a cancer diagnosis and a viewpoint of singularity is carrying out the quantum of 2-3 sorts of tumor markers desirable still more preferably. Although it can choose from the above-mentioned tumor marker suitably in order to carry out the quantum of two or more sorts of tumor markers From the tumor marker which consists of the case, for example, AFP, PIVKA-II, and CEA of hepatic carcinoma In the case of colon cancer (for example, the tumor marker which consists of CEA and CA 19-9) From the tumor marker which consists of the case 19-9, for example, CA, and CEA of a pancreatic cancer From the tumor marker which consists of a case of an esophagus cancer, for example, a carcinoembryonic antigen, (CEA), and POA From the case of gastric cancer, for example, alpha fetoprotein, (AFP), and the tumor marker which consists of CEA and CA 19-9 In the case of duodenal cancer, small intestinal cancer, and rectal cancer (for example, the tumor marker which consists of CEA and CA 19-9) It is desirable to choose in the case of a gall bladder cancer (for example, the tumor marker which consists of AFP, CEA, and CA 19-9), and also when it is any of digestive system cancer and/or hepatic carcinoma, it is still more desirable to choose from the tumor marker which consists of AFP, CEA, and CA 19-9.

[0010] Although it is naturally also possible to use for this invention some blood which a limit does not have at least the doner site in the extraction approach etc., and obtained at least the conventional doner site by the extraction approaches (for example, using the syringe for blood collecting mainly an elbow culmination vein 2 or more mLs extraction of whole blood etc.), the blood in blood support support This blood has the desirable extraction from the deletion blood vessel from a viewpoint of reduction of the invasiveness to the subject. The blood which carried out the puncture of an earlobe or the fingertip from a viewpoint of invasiveness reduction of the subject, and was extracted also in the extraction from a deletion blood vessel is more desirable. Especially the blood that carried out the puncture of the fingertip and extracted it from viewpoints, such as a point which the point that the subject can extract blood by itself, a point with little full realization at the time of a puncture, and blood tend to extract as a drop (dropping), is desirable.

[0011] Although there will be especially no limit as an approach of extracting peripheral blood liquid if blood is extractable, the method of massaging and/or warming, congesting well, the parts (for example, an earlobe, a fingertip, etc.) concerned of the subject before a puncture, wiping a site of puncture, making it dry with disinfected gauze for example, carrying out the puncture of the part concerned by disposable Lancet etc., and obtaining blood from a viewpoint that it can carry out for subject itself etc. is desirable.

[0012] Although the construction material of support, especially a configuration, etc. are not restricted as long as it is possible as support in blood support support to hold blood, maintenance of the blood by adsorption is easy, it is desirable that they are the construction material and the configuration where a constituent of blood tends to be eluted by extract, and it is still more desirable that it is an absorber from a viewpoint that maintenance by adsorption is easy. As construction material of support, well-known naturally-ocurring polymers, synthetic macromolecule, etc. can be used, for example, cotton, wool, a cellulose, polystyrene, polyolefine, polyurethane, a nitrocellulose, cellulose acetate, polyester, an epoxy resin, phenol resin, silk, a fibroin, a lignin, a hemicellulose, a chitin, ebonite, rubber, glass, a quartz, the ceramics, etc. are mentioned. In these, naturally-ocurring polymers are a cellulose and cotton desirable still more preferably, and it is a cellulose especially

preferably.
[0013] The absorber which consists of filter paper [which can use a well-known thing as support, for example, consists of the above-mentioned construction material etc.], nonwoven fabric, textile-fabrics, or sheet-like foam etc. is mentioned. Although the aperture of an absorber can carry out setting-out selection freely, the range of an average aperture has desirable 1-100 micrometers, and is 2-80 micrometers more preferably, and the range of it is 5-50 micrometers especially preferably. As a filter paper, it is JIS, for example. The filter paper specified to P3801 (1995) or TAPPI(Technical Association of the Pulp and Paper Industry) T205 is mentioned. As a nonwoven fabric, a polyolefine nonwoven fabric, a nitrocellulose nonwoven fabric, a cel SOL acetate nonwoven fabric, a polyester nonwoven fabric, an epoxy nonwoven fabric, a nonwoven glass fabric, a ceramic nonwoven fabric, etc. are mentioned, for example. As textile fabrics, a cheesecloth, wool cloth, a cellulose cloth, a polyolefine cloth, a nitrocellulose cloth, cel roll acetate cloth, an epoxy cloth, a glass fabric, a ceramic cloth, etc. are mentioned, for example.
[0014] As sheet-like foam, form polystyrene, foaming polyolefine, foaming polyurethane, foaming polyester, a foaming epoxy resin, foam glass, the foaming ceramics, etc. are mentioned, for example. the viewpoint (improvement in quantum precision) that an amount tends to become fixed to the filter paper, nonwoven fabric, and sheet-like foam of the blood absorbed to per unit volume or unit area in these — desirable — further — desirable — a filter paper and a nonwoven fabric — it is a filter paper, a polyolefine nonwoven fabric, a nitrocellulose nonwoven fabric, a cel SOL acetate nonwoven fabric, a polyester nonwoven fabric, an epoxy nonwoven fabric, a nonwoven glass fabric, and a ceramic nonwoven fabric especially preferably, and is a filter paper most preferably.
[0015] Although thickness, such as filter paper, nonwoven fabric, textile-fabrics, or sheet-like foam, can be chosen suitably, 0.1-3.0mm is 0.3-0.6mm especially preferably 0.2-1.0mm desirable still more preferably. although magnitude (area), such as filter paper, nonwoven fabric, textile-fabrics, or sheet-like foam, can be freely set up in consideration of the operability at the time of blood collecting, storage, and transport etc. — 1-200cm2 — desirable — further — desirable — 10-150cm2 — it is 2 25-100cm especially preferably.
[0016] The support to the support of blood will not be restricted especially if blood can be held, but it can make support support blood by contacting support and blood. As an approach of contacting support and blood, the approach of forcing support on the approach immersed in blood in support, the approach of trickling blood into support, and the puncture section etc. is mentioned, for example. The approach of forcing support on the approach and the puncture section which trickle blood into support from a viewpoint of simple nature among these is the approach of trickling blood into support desirable still more preferably.
[0017] Although the amount of the blood used is an amount in which support can be immersed and it is decided that it will be the magnitude of support when support is immersed in blood, 0.1-1ml 0.05-2ml is 0.15-0.5ml especially preferably desirable still more preferably. Although the amount of the blood used is determined as the magnitude of support when blood is dropped at support, 0.05-0.3ml 0.02-0.5ml is 0.1-0.2ml especially preferably desirable still more preferably. Although the amount of the blood used is determined as the magnitude of support when forcing support on the puncture section, 0.05-0.3ml 0.02-0.5ml is 0.1-0.2ml especially preferably desirable still more preferably.
[0018] When cutting off the blood support part of blood support support in fixed magnitude (after-mentioned), what is necessary is just to drop the blood more than the amount which can hold the support cut off, and it is not necessary to control the dropped blood volume to accuracy. For example, if the blood volume which the filter paper trickled in Watt Mann BFC180 (0.49mm in thickness) is 50microL, the magnitude of the part holding blood is about 12mm in diameter. Since one drop of volume is about 40-60microL, with a diameter of 6mm when piercing circularly, the amount of required blood becomes 1-2 drops about a blood support part.
[0019] Furthermore, after making blood hold from a viewpoint of the stability of blood, and the repeatability of a quantum to support, it is desirable to make it dry and it is still more desirable to dry until the weight of the blood held at support becomes 50 or less (preferably 30 or less % of the weight) % of the weight. As the desiccation approach, reduced pressure drying, frozen reduced pressure drying, fine stoving, simple desiccation (air dried), etc. can be applied, reduced pressure drying, frozen reduced pressure drying, and simple desiccation are reduced pressure drying and simple desiccation desirable still more preferably among these, for example, and it is simple desiccation especially preferably.
[0020] It is desirable to carry out on the conditions from which antigenic [of a tumor marker] does not change, it is still more desirable especially desirable to carry out at the temperature of 40 degrees C or less, and desiccation is performed at 10-30 degrees C. When decompressing, 0.05-2Pa 0.02-10Pa is 0.1-1Pa especially

preferably desirable still more preferably. 10 - 90%RH is desirable still more desirable, and the humidity in the case of carrying out simple desiccation is 40 - 80%RH, although there is especially no limit. Although it can set up suitably with the configuration of support, and the held blood volume, the drying time is 20 minutes - about 1 hour, when support is a filter paper.

[0021] the case where a blood hold back carrier is saved -- humidity -- below 80%RH -- desirable -- further -- desirable -- 10 - 60%RH -- it is 20 - 40%RH especially preferably, and 0-40 degrees C is desirable still more desirable, and 2-30 degrees C of temperature are 2-10 degrees C especially preferably. In addition, if it is in the condition which can maintain 80% below of humidity RH (sealing lower of drying-agent existence under sealing etc.), mail or parcel delivery service can convey.

[0022] It is desirable to carry out, after cutting off the blood support part of blood support support in fixed magnitude before the extract of a constituent of blood. For example, blood is dropped at a uniform absorber, and after making a perimeter carry out diffusion absorption and drying, the method of using for an extract what cut off the core in the fixed configuration is desirable [superfluous blood]. The approach of starting as an approach of cutting off along with the approach and the cutoff lines put in beforehand (perforation etc.) pierced by punch of a fixed diameter etc. is applicable.

[0023] Unless, as for the extract of blood support support to a constituent of blood, antigenic [of the tumor marker in blood (antigen)] changes, it can carry out that there is especially no limit, for example, blood support support can be immersed in the solution for an extract, and the supernatant liquid can be used as an extract. As a solution for an extract, pH can use the buffer solution of a neutral region, for example, the good buffer solution of pH 6-8, the phosphate buffer solution of pH 6-8, etc. are used preferably.

[0024] Moreover, a salt, a surfactant, protein, an antigen stabilizing agent, etc. can also be added in the solution for an extract. As a salt, a sodium chloride, potassium chloride, a lithium bromide, etc. are mentioned, for example. As a surface active agent, nonionic surface active agents, such as a sorbitan lauric-acid monoester ethylene oxide addition product (for example, Tween 20 and Tween 40 (the ICI United States)), etc. are mentioned, for example. As protein, cow serum albumin, casein, etc. are mentioned, for example. As an antigen stabilizing agent, a chelating agent, protease inhibitor, etc., such as EDTA, are mentioned, for example.

[0025] It is necessary to make regularity extraction conditions, such as the amount of the solution for an extract used to support, and extract time amount, from a viewpoint of quantum repeatability. As amount of the solution for an extract used, 0.1-1ml 0.05-5ml is 0.2-0.5ml especially preferably desirable still more preferably. As extract time amount, 0.5 - 480 minutes is 5 - 60 minutes especially preferably desirable still more preferably for 1 to 180 minutes. As for churning, it is desirable to shake and to perform a container using equipment like a vortex mixer, and the count of a shock has desirable 100 - 2000rpm.

[0026] For example, in the case of a filter paper (Watt Mann BFC180) with a diameter [cut out of blood support support] of 6mm (0.49mm in thickness), it can extract on condition that the following etc.

The solution presentation for an extract: 0.05 mols of sodium chloride content, L phosphate buffer solution (pH7.2) (the content of a sodium chloride: it is the same 0.85g per buffer-solution 100mL, and the following.)

Amount-used:200 which is a solution for an extract - 300microL extract temperature: Room temperature (15-25 degrees C)

Extract time amount: 20 minutes - 1 hour (neglect time amount after stirring)

Extract operation: Add the solution for an extract to support and carry out the above-mentioned time amount neglect at the above-mentioned temperature after stirring (500rpm, 1 minute) with a vortex mixer. It stirs again (they are 500rpm and 5 seconds with a vortex mixer), and after putting for 1 minute and making dispersed filter paper fiber sediment, digestive liquor is extracted and it uses as a specimen for tumor marker measurement (extract).

[0027] Although especially the quantum approach of the tumor marker in the above-mentioned extract is not restricted, the repeatability of a quantum value and the viewpoint of sensitometry to immunoassay is desirable. Although a conventionally well-known approach can be used as immunoassay, since the tumor marker concentration in an extract is lower than the concentration in blood, a measuring method with high quantum sensibility is desirable, for example, the radioimmunoassay (RIA), enzyme immunoassay (EIA), fluorescence immunoassay (FIA), and chemiluminescence immunoassay (CLIA) are desirable.

[0028] 2 part sandwiches measuring method using the solid phase antibody and I125 labelled antibody as radioimmunoassay (RIA) etc. is mentioned, and many measurement reagent kits are marketed. 2 part sandwiches measuring method using the solid phase antibody and the enzyme labelled antibody as enzyme immunoassay (EIA) etc. is mentioned, and the various measurement reagent kits using a peroxidase, the alkaline phosphatase,

glucose oxidase, etc. as an enzyme are marketed. 2 part sandwiches measuring method using the solid phase antibody and the europium labelled antibody as fluorescence immunoassay (FIA) etc. is mentioned. 2 part sandwiches measuring method using the solid phase antibody and the acridinium ester labelled antibody as chemiluminescence immunoassay (CLIA) etc. is mentioned, and various measurement reagent kits are marketed. Such desirable immunoassay is enzyme immunoassay (EIA), and it is chemiluminescence enzyme immunoassay (CLEIA) still more preferably.

[0029] From the tumor marker concentration in an extract, the approach using the calibration curve created using the blood support support with which the method of asking for the concentration of the tumor marker in blood could apply various approaches, for example, the concentration of (1) tumor marker supported known blood, the approach using the calibration curve which the concentration of (2) tumor markers created using the known extract, and the extractability of a tumor marker, etc. are mentioned.

[0030] In the approach of (2), extractability creates blood support support using the blood containing the tumor marker of known concentration, carries out the quantum of the content of the tumor marker in the extract extracted from now on, asks for the concentration of the tumor marker of an extract, and is called for from a degree type. As for extractability, it is desirable to perform the above actuation twice [at least] (preferably at least 3 times), and to use those averages.

Extractability =(concentration of tumor marker of extract)/(concentration of the tumor marker of blood)

the tumor marker concentration in the extract by which the tumor marker concentration in the blood of a specimen is prepared from a specimen — extractability — **** — although it can ask by things, the conditions of creation of blood support support and an extract need to be the same conditions as the time of asking for extractability in that case.

[0031] In addition, since the tumor marker by which a quantum is carried out by this invention exists by super-low concentration in blood, fluctuation of the extractability by fluctuation of concentration is very slight, for example, in the case of AFP, can use the same extractability in the range of 0.5 - 1,000 ng/mL. In the case of the high-concentration specimen exceeding 1,000 ng/mL, the extractability for which it asked may differ from actual extractability, but clinical decision is not influenced (that is, in the case of AFP, the boundary concentration of cancer decision is 10 ng/mL, and if it is over 1,000 ng/mL, in cancer decision, it is a positivity.).

[0032] Moreover, in the case of CEA, the same extractability can be used in the range of 0.5 - 200 ng/mL. In the case of the high-concentration specimen exceeding 200 ng/mL, the extractability for which it asked may differ from actual extractability, but clinical decision is not influenced (that is, in the case of CEA, the boundary concentration of cancer decision is 5 ng/mL, and if it is over 200 ng/mL, in cancer decision, it is a positivity.). tumor markers other than AFP and CEA — the same — the concentration of a tumor marker — clinical decision is not influenced

[0033] (1) And as for the blood or the extract in which the tumor marker of known concentration is included in any [of the approach of (2)] case, it is desirable to use two or more sorts from which concentration differs. Although the concentration of the blood containing the tumor marker of known concentration or an extract can be freely set up according to the class of tumor marker to measure Usually, since a cut-off is usually before and after 10 ng/mL when it is desirable to set up by the concentration to which possibility of being healthy people's range (normal region) and cancer can measure clearly boundary concentration (cut-off) with the high range, for example, it is AFP, As for the blood containing the tumor marker of known concentration, in the case of the approach of (1), it is desirable to carry out 2 concentration (for example, 5 or more ng/mL [of concentration of less than 10 ng/mL], 10 or more ng/mL concentration of less than 50 ng/mL) setting out on both sides of 10 ng/mL at least. Moreover, in the case of the approach of (2), since it is the concentration of the tumor marker in an extract, it is desirable to set it as 2 concentration (for them to be 0.1 or more ng/mL of concentration of less than 0.2 ng/mL, and 0.2 or more ng/mL the concentration of less than 1 ng/mL, since concentration 10 ng/mL in blood is equivalent to concentration 0.2 ng/mL in an extract when extractability is 0.02) which took extractability into consideration based on 10 ng/mL.

[0034] Moreover, since a cut-off is usually before and after 5 ng/mL in the case of CEA, in the case of the approach of (1), it is desirable [the blood containing the tumor marker of known concentration] to carry out 2 concentration (for example, 2 or more ng/mL [of concentration of less than 5 ng/mL], 5 or more ng/mL concentration of less than 25 ng/mL) setting out on both sides of 5 ng/mL at least. Moreover, in the case of the approach of (2), since it is the concentration of the tumor marker in an extract, it is desirable to set it as 2 concentration (for them to be 0.05 or more ng/mL of concentration of less than 0.1 ng/mL, and 0.1 or more

ng/mL the concentration of less than 0.5 ng/mL, since concentration 5 ng/mL in blood is equivalent to concentration 0.1 ng/mL in an extract when extractability is 0.02) which took extractability into consideration based on 5 ng/mL.
[0035] Moreover, since a cut-off is usually before and after 37 U/mL in the case of CA 19-9, in the case of the approach of (1), it is desirable [the blood containing the tumor marker of known concentration] to carry out 2 concentration (for example, 5 or more U/mL [of concentration of less than 37 U/mL], 37 or more U/mL concentration of less than 100 U/mL) setting out on both sides of 37 U/mL at least. Moreover, in the case of the approach of (2), since it is the concentration of the tumor marker in an extract, it is desirable to set it as 2 concentration (for them to be 0.1 or more U/mL of concentration of less than 0.74 U/mL, and 0.74 or more U/mL the concentration of less than 2.0 U/mL, since concentration 37 U/mL in blood is equivalent to concentration 0.74 U/mL in an extract when extractability is 0.02) which took extractability into consideration based on 37 U/mL.
[0036] When the cut-offs of tumor markers other than AFP, CEA, and CA19-9 are enumerated, they are IAP:501microg/mL, ferritin:200 ng/mL, a polyamine:45micromol/g creatinine, POA:20 U/mL, KMO-1:600 U/mL, DuPAN-2:400 U/mL, CA50:36 U/mL, CA72-4:4 U/mL, TPA:130 U/L, and PIVKA-II:0.1 AU/mL, for example.
[0037] By the approach of (1), since the blood the point which needs to be carried out to creation of a calibration curve from extract operation, and for calibration-curve creation cannot be saved for a long period of time, there is troublesomeness created in the case of measurement, but even if it changes an extraction condition, there is the advantage in which exact measurement can be performed. On the other hand, the approach of (2) asks for extractability beforehand, and if conditions, such as extract operation, are fixed, it can measure a lot of specimens correctly and simple. (1) And the approach of of the viewpoint of simplicity to (2) is desirable among the approaches of (2).
[0038] The quantum approach of this invention is the optimal, when it can hold and dry, it can convey to blood collecting and support (for example, bringing, mail, parcel delivery service, etc.) and it collects and carries out the quantum of many specimens to them from a large area like the medical checkup of digestive system cancer and hepatic carcinoma for subject itself. Moreover, also in the followup of the cancer treatment to the patient of a remote place besides an examination for cancer etc., it is applicable.
[0039]
[Example] Hereafter, although an example explains this invention further, this invention is not limited to this.
[0040] Even if <example 1> this example saves blood support support for a long period of time, it shows that the quantum of the tumor marker (AFP) can be carried out to accuracy.
1. After it Massages and Warms and Congesting Well Fingertip of Six Creation Volunteers (Subject A-F) of Blood Collecting and Blood Support Support (Blood Desiccation Filter Paper), Wiping Site of Puncture and Making it Dry with Gauze for Disinfection A puncture is carried out by disposable Lancet (a trade name "HEMORETTO", Green Cross Corp. make), the first blood drop is wiped away, two drops of blood drops as follows were directly dropped at filter paper (lot number BFC180, Watt Mann, Inc. make) ******** for blood collecting of ten per subject, and it was made to absorb them from a fingertip. Subsequently, it was indoors (25**1 degree C, 65**5% RH) air-dry (the air-dried time amount 5, 20, 40, and 60 or 120 minutes), and blood support support (blood desiccation filter paper) was obtained. The weight of blood support support (blood desiccation filter paper) was measured for every **** time amount, and the ratio to initial blood weight (value except filter paper weight) was asked for aridity (average of two blood support support). This aridity was shown in a table 1. Subsequently, blood support support (blood desiccation filter paper) was saved on the preservation conditions of table 1 publication (preservation days 0, 3, 7, 14, and 28 days).
[0041]
[A table 1]

条件No.	乾燥時間（分）	乾燥度（%）	保存条件	
			温度（℃）	湿度（%RH）
1 a	5	7 8	4 ± 2	3 5 ± 5
1 b	5	7 8	2 5 ± 2	5 5 ± 5
2 a	2 0	4 7	4 ± 2	3 5 ± 5
2 b	2 0	4 7	2 5 ± 2	5 5 ± 5
3 a	4 0	3 4	4 ± 2	3 5 ± 5
3 b	4 0	3 4	2 5 ± 2	5 5 ± 5
4 a	6 0	2 8	4 ± 2	3 5 ± 5
4 b	6 0	2 8	2 5 ± 2	5 5 ± 5
5 a	1 2 0	2 6	4 ± 2	3 5 ± 5
5 b	1 2 0	2 6	2 5 ± 2	5 5 ± 5

[0042] 2. Actuation below extract operation was carried out in the interior of a room with a temperature of 20-25 degrees C. The core of the blood support part of each blood support support (blood desiccation filter paper) saved on condition that a table 1 was pierced by 1 hole punch (object marketed as an object for clerical work) with a diameter of 6mm, and the filter paper piece was obtained. 0.05 mols of sodium chloride content and filter paper piece and 250micro [of L phosphate buffer solutions] (pH7.2) (solution for extract) L pierced in the test tube were added, and after carrying out stirring (it is 500rpm with a vortex mixer) for 30 seconds, it was left for 30 minutes. Then, after stirring like for 30 seconds, it put for 1 minute, and supernatant liquid was isolated preparatively, the extract was prepared, and the quantum of a tumor marker was presented with this.
[0043] 3. As a reagent for quantum quanta of the tumor marker (AFP) in an extract, "SUFI alite AFP" put on the market by Wako Pure Chem Industries as a clinical laboratory test medicine was used. The "SUFI alite AFP control set" put on the market by Wako Pure Chem Industries was used for the standard solution for determining the amount of tumor markers in an extract. As a quantitative analyzing instrument, SphereLight180 by Olympus Optical Co., Ltd. was used. The quantum of AFP is made with chemiluminescence enzyme immunoassay by using this reagent and equipment. The amount of specimens which is clinical laboratory test medicine for the reagent for quanta to be used to measure the tumor marker concentration in a blood serum, and is usually used for measurement is set as 10microL, it gets down, and reaction time is total about 15 minutes. Since it was low concentration from the inside of a blood serum in the case of the quantum of the tumor marker in an extract, 100microL activity of an extract was done.
[0044] 4. The stability for which it asked by the quantum result quantum result and the degree type was shown in tables 2-11.
(Stability) =(quantum value after predetermined retention period) x100/(initial quantum value)
In addition, after creating blood support support, the initial quantum value supplied blood support support to the solution for an extract promptly, started and carried out the quantum of the extract operation, and showed it as retention period zero day. The storage temperature of 4 degrees C showed and the tumor marker (antigen: AFP) in the extract obtained from the blood support support (blood desiccation filter paper) created and saved with the monograph affair showed the value of 90% or more of stability for seven days at 25 degrees C 28 days except for the case where the drying time is 5 minutes. Therefore, when the drying time was 20 minutes or more, it turned out that the tumor marker (antigen: AFP) in blood support support (blood desiccation filter paper) is stable.
[0045]
[A table 2]
条件No：1a

被検者	AFP濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.093	0.090	0.089	0.084	0.079	97	96	90	85
B	0.054	0.052	0.049	0.046	0.037	96	91	85	69
C	0.073	0.070	0.059	0.064	0.059	96	81	88	81
D	0.064	0.062	0.059	0.056	0.047	97	92	88	73
E	0.125	0.122	0.121	0.116	0.111	98	97	93	89
F	0.074	0.071	0.067	0.063	0.051	96	91	85	69
					平均	97	91	88	78

[0046]

[A table 3]

条件No：1b

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.094	0.085	0.076	0.045	0.039	90	81	48	41
B	0.053	0.042	0.036	0.026	0.018	79	68	49	34
C	0.074	0.065	0.056	0.025	0.019	88	76	34	26
D	0.063	0.052	0.046	0.036	0.028	83	73	57	44
E	0.126	0.177	0.108	0.077	0.071	93	86	61	56
F	0.073	0.058	0.050	0.036	0.025	79	68	49	34
				平均		85	75	50	39

[0047]

[A table 4]

条件No：2a

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.092	0.093	0.090	0.091	0.089	101	98	99	97
B	0.054	0.053	0.052	0.050	0.049	98	96	93	91
C	0.072	0.073	0.070	0.071	0.069	101	97	99	96
D	0.064	0.063	0.062	0.060	0.059	98	97	94	92
E	0.124	0.125	0.122	0.123	0.121	101	98	99	98
F	0.074	0.073	0.071	0.069	0.067	98	96	93	91
				平均		100	97	96	94

[0048]

[A table 5]

条件No：2b

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.093	0.089	0.084	0.078	0.072	96	90	84	77
B	0.053	0.050	0.048	0.043	0.039	94	91	81	74
C	0.073	0.069	0.064	0.058	0.052	95	88	79	71
D	0.063	0.060	0.058	0.053	0.049	95	92	84	78
E	0.125	0.121	0.116	0.110	0.104	97	93	88	83
F	0.073	0.069	0.066	0.059	0.053	94	91	81	74
				平均		95	91	83	76

[0049]

[A table 6]

条件No：3a

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.094	0.093	0.093	0.091	0.092	99	99	97	98
B	0.052	0.053	0.052	0.051	0.050	102	100	98	96
C	0.074	0.073	0.073	0.071	0.072	99	99	96	97
D	0.062	0.063	0.061	0.060	0.059	102	98	97	95
E	0.126	0.125	0.125	0.123	0.124	99	99	98	98
F	0.071	0.073	0.071	0.070	0.069	102	100	98	96
				平均		101	99	97	97

[0050]

[A table 7]

条件Ｎｏ：３ｂ

被検者	ＡＦＰ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.092	0.089	0.086	0.082	0.078	97	93	89	85
B	0.054	0.052	0.050	0.049	0.047	96	93	91	87
C	0.072	0.069	0.066	0.062	0.058	96	92	86	81
D	0.064	0.062	0.060	0.059	0.057	97	94	92	89
E	0.124	0.121	0.118	0.114	0.110	98	95	92	89
F	0.074	0.071	0.069	0.067	0.064	96	93	91	87
					平均	97	93	90	86

[0051]
[A table 8]
条件Ｎｏ：４ａ

被検者	ＡＦＰ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.093	0.094	0.093	0.091	0.089	101	100	98	96
B	0.053	0.053	0.052	0.051	0.049	100	98	96	92
C	0.073	0.074	0.073	0.071	0.069	101	100	97	95
D	0.063	0.063	0.062	0.061	0.059	100	98	97	94
E	0.125	0.126	0.125	0.123	0.121	101	100	98	97
F	0.073	0.073	0.071	0.070	0.067	100	98	96	92
					平均	101	99	97	94

[0052]
[A table 9]

条件Ｎｏ：４ｂ

被検者	ＡＦＰ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.093	0.089	0.087	0.085	0.081	96	94	91	87
B	0.052	0.050	0.048	0.047	0.045	96	92	90	87
C	0.073	0.069	0.067	0.065	0.061	95	92	89	84
D	0.062	0.060	0.058	0.057	0.055	97	94	92	89
E	0.125	0.121	0.119	0.117	0.113	97	95	94	90
F	0.071	0.069	0.066	0.064	0.062	96	92	90	87
					平均	96	93	91	87

[0053]
[A table 10]
条件Ｎｏ：５ａ

被検者	ＡＦＰ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.092	0.093	0.092	0.093	0.090	101	100	101	98
B	0.053	0.053	0.052	0.050	0.051	100	98	94	96
C	0.072	0.073	0.072	0.073	0.070	101	100	101	97
D	0.063	0.063	0.062	0.060	0.061	100	98	95	97
E	0.124	0.125	0.124	0.125	0.122	101	100	101	98
F	0.073	0.073	0.071	0.069	0.070	100	98	94	96
					平均	101	99	98	97

[0054]
[A table 11]

条件No：5b

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.094	0.090	0.089	0.086	0.082	96	95	91	87
B	0.053	0.050	0.050	0.048	0.048	94	94	91	91
C	0.074	0.070	0.069	0.066	0.072	95	93	89	97
D	0.063	0.060	0.060	0.058	0.058	95	95	92	92
E	0.126	0.122	0.121	0.118	0.114	97	96	94	90
F	0.073	0.069	0.069	0.066	0.066	94	94	91	91
					平均	95	95	91	91

[0055] Even if <example 2> this example saves blood support support for a long period of time, it shows by the case that the quantum of the tumor marker (CEA) can be carried out to accuracy.
1. Like the creation example 1 of blood collecting and blood support support (blood desiccation filter paper), blood support support (blood desiccation filter paper) was prepared from six volunteers (subject A-F), and it saved on the preservation conditions of table 1 publication (preservation days 0, 3, 7, 14, and 28 days).
2. Like the extract operation example 1, the extract was prepared and the quantum of a tumor marker was presented with this.
[0056] 3. The quantum measurement reagent of the tumor marker (CEA) in an extract used "SUFI alite CEA" put on the market by Wako Pure Chem Industries as a clinical laboratory test medicine. The "SUFI alite CEA control set" put on the market by Wako Pure Chem Industries was used for the standard solution for determining the amount of tumor markers in an extract. As a quantitative analyzing instrument, SphereLight180 by Olympus Optical Co., Ltd. was used. The quantum of CEA is made with chemiluminescence enzyme immunoassay by using this reagent and equipment. The amount of specimens which is clinical laboratory test medicine for the reagent for quanta to be used to measure the tumor marker concentration in a blood serum, and is usually used for measurement is set as 40microL, it gets down, and reaction time is total about 15 minutes. Since it was low concentration from the inside of a blood serum in the case of the quantum of the tumor marker in an extract, 100microL activity of an extract was done. Moreover, reaction time was extended in 29 minutes.
[0057] 4. The stability for which it asked like the quantum result quantum result and the example 1 was shown in tables 12-21. In addition, after creating blood support support, the initial quantum value supplied blood support support to the solution for an extract promptly, started and carried out the quantum of the extract operation, and showed it as retention period zero day. The storage temperature of 4 degrees C showed and the tumor marker (antigen: CEA) in the extract obtained from the blood support support (blood desiccation filter paper) created and saved with the monograph affair showed the value of 90% or more of stability for seven days at 25 degrees C 28 days except for the case where the drying time is 5 minutes. Therefore, when the drying time was 20 minutes or more, it turned out that the tumor marker (antigen: CEA) in blood support support (blood desiccation filter paper) is stable.
[0058]
[A table 12]

条件No：1a

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.045	0.044	0.040	0.036	95	93	85	76
B	0.063	0.060	0.055	0.049	0.034	94	86	78	53
C	0.063	0.060	0.059	0.054	0.049	95	94	86	78
D	0.034	0.032	0.029	0.026	0.017	94	85	76	50
E	0.135	0.130	0.129	0.120	0.112	96	95	89	83
F	0.055	0.051	0.047	0.042	0.027	94	85	76	49
					平均	95	90	82	65

[0059]
[A table 13]

条件Ｎｏ：１ｂ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.040	0.034	0.017	0.012	85	71	35	24
B	0.061	0.042	0.032	0.014	0.018	69	52	24	29
C	0.063	0.054	0.046	0.025	0.019	86	73	40	30
D	0.033	0.022	0.016	0.006	0.008	67	48	18	24
E	0.135	0.120	0.107	0.072	0.062	89	79	53	46
F	0.053	0.035	0.025	0.009	0.012	66	48	17	23
					平均	77	62	31	29

[0060]
[A table 14]

条件Ｎｏ：２ａ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.047	0.048	0.045	0.046	0.044	102	96	98	95
B	0.063	0.061	0.060	0.058	0.058	97	94	92	92
C	0.062	0.063	0.060	0.061	0.059	102	97	98	95
D	0.034	0.033	0.032	0.031	0.031	97	94	91	91
E	0.134	0.135	0.130	0.132	0.129	101	97	99	96
F	0.055	0.053	0.051	0.050	0.050	97	94	91	91
					平均	99	95	95	93

[0061]
[A table 15]
条件Ｎｏ：２ｂ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.044	0.043	0.038	0.032	93	90	79	67
B	0.061	0.058	0.056	0.053	0.046	94	92	86	75
C	0.063	0.059	0.057	0.051	0.044	94	90	81	70
D	0.033	0.031	0.030	0.028	0.024	94	91	85	73
E	0.135	0.129	0.125	0.115	0.103	95	93	85	77
F	0.053	0.050	0.048	0.045	0.038	94	91	85	72
					平均	94	91	84	72

[0062]
[A table 16]
条件Ｎｏ：３ａ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.048	0.048	0.046	0.047	100	100	97	98
B	0.060	0.061	0.060	0.058	0.056	103	100	97	94
C	0.063	0.063	0.063	0.061	0.062	100	100	97	98
D	0.032	0.033	0.032	0.031	0.030	103	100	97	94
E	0.135	0.135	0.135	0.132	0.134	100	100	98	99
F	0.051	0.053	0.051	0.050	0.048	103	100	97	94
					平均	101	100	97	96

[0063]
[A table 17]

条件Ｎｏ：３ｂ

被検者	ＣＥＡ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.047	0.044	0.043	0.039	0.035	95	91	82	75
B	0.063	0.060	0.058	0.055	0.051	94	92	86	81
C	0.062	0.059	0.057	0.052	0.048	95	92	84	77
D	0.034	0.032	0.031	0.029	0.027	94	91	85	79
E	0.134	0.129	0.125	0.117	0.110	96	94	87	82
F	0.055	0.051	0.050	0.047	0.043	94	91	85	79
					平均	95	92	85	79

[0064]

[A table 18]

条件Ｎｏ：４ａ

被検者	ＣＥＡ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.048	0.049	0.048	0.046	0.044	102	100	97	93
B	0.061	0.061	0.060	0.058	0.056	100	97	94	91
C	0.063	0.064	0.063	0.061	0.059	102	100	97	94
D	0.033	0.033	0.032	0.031	0.029	100	97	94	88
E	0.135	0.137	0.135	0.132	0.129	101	100	98	95
F	0.053	0.053	0.051	0.050	0.048	100	97	94	90
					平均	101	99	96	92

[0065]

[A table 19]

条件Ｎｏ：４ｂ

被検者	ＣＥＡ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.048	0.044	0.043	0.041	0.038	93	90	86	79
B	0.060	0.056	0.055	0.051	0.048	94	91	86	80
C	0.063	0.059	0.057	0.055	0.051	94	90	87	81
D	0.032	0.030	0.029	0.027	0.025	94	91	84	78
E	0.135	0.129	0.125	0.122	0.115	95	93	90	85
F	0.051	0.048	0.047	0.043	0.040	94	90	84	78
					平均	94	91	86	80

[0066]

[A table 20]

条件Ｎｏ：５ａ

被検者	ＣＥＡ濃度(ng/ml) 保存期間（日）					安定度（%） 保存期間（日）			
	0	3	7	14	28	3	7	14	28
A	0.047	0.048	0.047	0.048	0.045	102	100	102	96
B	0.061	0.061	0.060	0.056	0.058	100	97	92	94
C	0.062	0.063	0.062	0.063	0.060	102	100	102	97
D	0.033	0.033	0.032	0.030	0.031	100	97	91	94
E	0.134	0.135	0.134	0.135	0.130	101	100	101	97
F	0.053	0.053	0.051	0.048	0.050	100	97	91	94
					平均	101	99	97	95

[0067]

[A table 21]

条件No：5b

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.049	0.045	0.044	0.042	0.039	93	92	86	80
B	0.061	0.058	0.056	0.055	0.053	94	92	89	86
C	0.064	0.060	0.059	0.056	0.052	94	92	88	81
D	0.033	0.031	0.030	0.029	0.028	94	91	88	85
E	0.137	0.130	0.129	0.124	0.117	95	94	90	85
F	0.053	0.050	0.048	0.047	0.045	94	91	88	85
					平均	94	92	88	84

[0068] Even if <example 3> this example saves blood support support for a long period of time, it shows by the case that the quantum of the tumor marker (CA 19-9) can be carried out to accuracy.
1. Like the creation example 1 of blood collecting and blood support support (blood desiccation filter paper), blood support support (blood desiccation filter paper) was prepared from six volunteers (subject A-F), and it saved on the preservation conditions of table 1 publication (preservation days 0, 3, 7, 14, and 28 days).
2. Like the extract operation example 1, the extract was prepared and the quantum of a tumor marker was presented with this.
[0069] 3. The quantum measurement reagent of the tumor marker in an extract (CA 19-9) used "SUFI alite CA 19-9" put on the market by Wako Pure Chem Industries as a clinical laboratory test medicine. The "SUFI alite C19-9A control set" put on the market by Wako Pure Chem Industries was used for the standard solution for determining the amount of tumor markers in an extract. As a quantitative analyzing instrument, SphereLight180 by Olympus Optical Co., Ltd. was used. The quantum of CA 19-9 is made with chemiluminescence enzyme immunoassay by using this reagent and equipment.
[0070] The amount of specimens which is clinical laboratory test medicine for the reagent for quanta to be used to measure the tumor marker concentration in a blood serum, and is usually used for measurement is set as 10microL, it gets down, and reaction time is total about 15 minutes. Since it was low concentration from the inside of a blood serum in the case of the quantum of the tumor marker in an extract, 100microL activity of an extract was done. Moreover, reaction time was extended in 29 minutes.
[0071] 4. The stability for which it asked like the quantum result quantum result and the example 1 was shown in tables 22-31. In addition, after creating blood support support, the initial quantum value supplied blood support support to the solution for an extract promptly, started and carried out the quantum of the extract operation, and showed it as retention period zero day. The storage temperature of 4 degrees C showed and the tumor marker (antigen: CA 19-9) in the extract obtained from the blood support support (blood desiccation filter paper) created and saved with the monograph affair showed the value of 90% or more of stability for seven days at 25 degrees C 28 days except for the case where the drying time is 5 minutes. Therefore, when the drying time was 20 minutes or more, it turned out that the tumor marker (antigen: CA 19-9) in blood support support (blood desiccation filter paper) is stable.
[0072]
[A table 22]

条件No：1a

被検者	CA19-9濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.719	0.701	0.689	0.679	0.661	98	96	95	92
B	0.425	0.399	0.370	0.341	0.320	94	87	80	75
C	0.443	0.432	0.425	0.419	0.408	98	96	95	92
D	0.078	0.073	0.068	0.063	0.060	94	88	81	77
E	0.565	0.551	0.542	0.534	0.520	98	96	95	92
F	0.164	0.154	0.143	0.132	0.124	94	87	80	76
					平均	96	92	88	84

[0073]
[A table 23]

条件Ｎｏ：１ｂ

検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
被	0	3	7	14	28	3	7	14	28
A	0.715	0.663	0.663	0.569	0.515	93	89	80	72
B	0.428	0.367	0.325	0.273	0.226	86	76	64	53
C	0.440	0.408	0.390	0.351	0.318	93	89	80	72
D	0.078	0.068	0.061	0.052	0.044	87	78	66	56
E	0.562	0.521	0.498	0.447	0.405	93	89	80	72
F	0.165	0.142	0.126	0.106	0.088	86	76	64	53
				平均		90	83	72	63

[0074]

[A table 24]

条件Ｎｏ：２ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.713	0.707	0.697	0.689	0.689	99	98	97	97
B	0.425	0.412	0.402	0.388	0.383	97	94	91	90
C	0.440	0.436	0.429	0.425	0.425	99	98	97	97
D	0.078	0.076	0.074	0.072	0.071	97	95	92	91
E	0.561	0.556	0.548	0.542	0.542	99	98	97	97
F	0.164	0.159	0.155	0.150	0.148	97	95	91	90
				平均		98	96	94	94

[0075]

[A table 25]

条件Ｎｏ：２ｂ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.717	0.691	0.675	0.637	0.622	96	94	89	87
B	0.423	0.399	0.383	0.365	0.346	94	91	86	82
C	0.442	0.426	0.416	0.393	0.383	96	94	89	87
D	0.077	0.073	0.071	0.067	0.064	95	91	87	83
E	0.564	0.543	0.531	0.501	0.489	96	94	89	87
F	0.163	0.154	0.148	0.141	0.134	94	91	87	82
				平均		95	93	89	85

[0076]

[A table 26]

条件Ｎｏ：３ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.716	0.717	0.708	0.705	0.697	100	99	98	97
B	0.420	0.423	0.412	0.396	0.386	101	98	94	92
C	0.441	0.442	0.436	0.434	0.429	100	99	98	97
D	0.077	0.077	0.076	0.073	0.071	101	98	95	92
E	0.563	0.564	0.557	0.554	0.548	100	99	98	97
F	0.162	0.163	0.159	0.153	0.149	101	98	94	92
				平均		101	99	96	95

[0077]

[A table 27]

条件Ｎｏ：３ｂ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.711	0.715	0.691	0.675	0.660	101	97	95	93
B	0.428	0.404	0.389	0.378	0.365	94	91	88	85
C	0.438	0.440	0.426	0.416	0.407	101	97	95	93
D	0.078	0.074	0.072	0.070	0.067	95	91	89	86
E	0.559	0.562	0.543	0.531	0.519	101	97	95	93
F	0.165	0.156	0.150	0.146	0.141	95	91	88	85
					平均	98	94	92	89

[0078]

[A table 28]

条件Ｎｏ：４ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.716	0.711	0.713	0.706	0.688	99	100	99	96
B	0.423	0.425	0.404	0.402	0.394	101	96	95	93
C	0.441	0.438	0.440	0.435	0.424	99	100	99	96
D	0.077	0.078	0.074	0.074	0.072	101	96	95	94
E	0.563	0.559	0.561	0.555	0.541	99	100	99	96
F	0.163	0.164	0.156	0.155	0.152	101	96	95	93
					平均	100	98	97	95

[0079]

[A table 29]

条件Ｎｏ：４ｂ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.712	0.711	0.698	0.680	0.672	100	98	96	94
B	0.420	0.396	0.386	0.378	0.367	94	92	90	88
C	0.439	0.438	0.430	0.419	0.414	100	98	96	94
D	0.077	0.073	0.071	0.070	0.068	95	92	91	88
E	0.560	0.559	0.549	0.535	0.528	100	98	96	94
F	0.162	0.153	0.149	0.146	0.142	94	92	90	88
					平均	97	95	93	91

[0080]

[A table 30]

条件Ｎｏ：５ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.715	0.716	0.702	0.707	0.694	100	98	99	97
B	0.428	0.415	0.420	0.404	0.388	97	98	94	91
C	0.440	0.441	0.433	0.436	0.428	100	98	99	97
D	0.078	0.076	0.077	0.074	0.072	97	98	95	91
E	0.562	0.563	0.552	0.556	0.546	100	98	99	97
F	0.165	0.160	0.162	0.156	0.150	97	98	95	91
					平均	99	98	97	94

[0081]

[A table 31]

条件No：5b

被検者	CA19－9濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.717	0.712	0.698	0.680	0.663	99	97	95	92
B	0.423	0.407	0.402	0.383	0.365	96	95	91	86
C	0.442	0.439	0.430	0.419	0.408	99	97	95	92
D	0.077	0.075	0.074	0.071	0.067	97	95	91	87
E	0.564	0.560	0.549	0.535	0.521	99	97	95	92
F	0.163	0.157	0.155	0.148	0.141	96	95	91	87
					平均	98	96	93	89

[0082] It is shown that <example 4> this example has the AFP concentration for which it asked by the approach of this invention, and the AFP concentration by the conventional approach in a good correlation.
1. From five creation volunteers (subject G-K) of standard AFP addition blood support support, blood 1.8mL was extracted, it divided [0.9mLx2], and 100microL, in addition standard AFP addition blood were prepared for the standard AFP solution (400 ng/mL) of a "SUFI alite AFP control set" to one of these. 100micro of standard AFP addition blood was dropped at the filter paper (BFC180, Watt Mann, Inc. make) L times, it dried at the room temperature (25**2 degrees C) for 1 hour, and standard AFP addition blood support support ** was created. Similarly, 0.9ml of blood of the method of other 1 was dropped and dried at the filter paper, and blood support support ** was created.
[0083] 2. Like the extract approach of an extract and measurement example 1 publication, the extract was prepared, respectively from standard AFP addition blood support support ** and blood support support **, and the AFP concentration in an extract was measured. Those results were shown in a table 32.
[0084]
[A table 32]

被検者	抽出液中のAFP濃度(ng/ml) 標準AFP添加血液担持担体①(A)	標準AFP添加血液担持担体②(B)	B－A	抽出率 (B－A)/40
G	0.086	0.876	0.790	0.0198
H	0.043	0.841	0.798	0.0200
I	0.028	0.834	0.806	0.0202
J	0.034	0.829	0.795	0.0199
K	0.065	0.865	0.800	0.0200
平均	0.051	0.849	0.798	0.0199

[0085] 3. Extractability was computed from the degree type from the measured value shown in the menue 32 of extractability. Those results were shown in a table 32. The average of the extractability in five persons' blood was set up as extractability (0.0199) at the time of creating and extracting on these conditions.
Extractability = (B-A) / CA: AFP concentration C:40 ng/mL in the extract prepared from the AFP concentration B:standard AFP (400 ng/mL) addition blood support support in the extract prepared from blood support support ** (the added amount of AFP)
[0086] 4. It collected blood from 20 names including the blood collecting hepatic-carcinoma patient. Blood collecting was carried out by the conventional approach (it extracts 2 or more mLs of whole blood from an elbow culmination vein using the syringe for blood collecting) from the example 1 written approach (from a fingertip to blood collecting), and the elbow culmination vein. After putting the whole blood extracted from the elbow culmination vein at a room temperature for 1 hour or more, cooling centrifugal [of it] was carried out for 1500 G or 10 minutes with the refrigerated centrifuge, and it isolated the supernatant liquid (blood serum) part preparatively further.
[0087] 5. Blood support support (blood desiccation filter paper) was created like the approach of creation example 1 publication of blood support support (blood desiccation filter paper). The drying time was made into the 1 same hour as the case of extractability setting out.
[0088] 6. Extract and AFP density measurement were carried out by the approach same about an extract and quantum blood support support as the case of extractability setting out. It measured the condition as the description which is "SUFI alite AFP" of example 1 publication, and was attached to the measurement reagent on the other hand about the blood serum extracted and separated by the conventional approach (amount of

specimens 10microL).
[0089] 7. AFP concentration in the extract prepared from the decision blood support support of the AFP concentration in blood was **(ed) by extractability (0.0199), and it asked for the AFP concentration in blood. The concentration of AFP in the blood serum for which it asked by the conventional approach, and the AFP concentration in the blood for which it asked by the approach of this invention were shown in a table 33. Moreover, the correlation diagram of the AFP concentration by the approach of this invention and the AFP concentration by the conventional method was shown in drawing 1 using these values. The AFP concentration in the blood serum in a conventional method and the AFP concentration in blood by the approach of this invention showed good functionality so that drawing 1 might show. A formula shows a correlation type (X: AFP concentration in a conventional method, AFP concentration in the approach of Y:this invention) among drawing 1 , and R shows a correlation coefficient.
[0090]
[A table 33]

単位：ｎｇ／ｍＬ

	従来法による	本発明の定量方法	
被検者	ＡＦＰ濃度	抽出液中のＡＦＰ濃度	血液中のＡＦＰ濃度
1	4．1	0．072	3．62
2	18．6	0．409	20．57
3	25．7	0．471	23．67
4	90．7	1．730	86．93
5	63．0	1．360	68．34
6	34．8	0．693	34．82
7	52．3	1．046	52．56
8	5．7	0．132	6．63
9	17．4	0．346	17．39
10	10．5	0．202	10．15
11	1．4	0．036	1．81
12	2．5	0．043	2．16
13	3．8	0．084	4．22
14	8．4	0．187	9．40
15	7．6	0．132	6．63
16	15．2	0．314	15．78
17	69．4	1．528	76．78
18	42．5	0．910	45．73
19	6．2	0．104	5．23
20	2．4	0．058	2．91

[0091] It is shown that <example 5> this example has the CEA concentration for which it asked by the approach of this invention, and the CEA concentration by the conventional approach in a good correlation.
1. From five creation volunteers (subject G-K) of standard CEA addition blood support support, blood 1.8mL was extracted, it divided [0.9mLx2], and 100microL, in addition standard CEA addition blood (0 ng/mL, 150 ng/mL) were prepared for the standard CEA solution (0 or 150 ng/mL) of a "SUFI alite CEA control set" to one of these, respectively. 100micro (150 ng/mL) of standard CEA addition blood was dropped at the filter paper (BFC180, Watt Mann, Inc. make) L times, it dried at the room temperature (25**2 degrees C) for 1 hour, and standard CEA addition blood support support ** was created. Similarly, 100micro (0 ng/mL) of blood L of the method of other 1 was dropped and dried at the filter paper, and blood support support ** was created.
[0092] 2. Like the extract approach of an extract and measurement example 2 publication, the extract was prepared, respectively from standard CEA addition blood support support ** and blood support support **, and the CEA concentration in an extract was measured. Those results were shown in a table 34.
[0093]
[A table 34]

被検者	抽出液中のＣＥＡ濃度(ｎｇ／ｍｌ) 標準ＣＥＡ添加血液担持担体① (A)	標準ＣＥＡ添加血液担持担体② (B)	B－A	抽出率 (B－A)／15
G	0．076	0．375	0．299	0．0199
H	0．033	0．335	0．302	0．0201
I	0．041	0．338	0．297	0．0198
J	0．084	0．382	0．298	0．0199
K	0．024	0．324	0．300	0．0200
平　均	0．052	0．351	0．299	0．0199

[0094] 3. Extractability was computed from the degree type from the measured value shown in the menue 34 of extractability. Those results were shown in a table 34. The average of the extractability in five persons' blood was set up as extractability (0.0199) at the time of creating and extracting on these conditions.
Extractability = (B-A) / CA: CEA concentration C:15 ng/mL in the extract prepared from the CEA concentration B:standard CEA (150 ng/mL) addition blood support support in the extract prepared from blood support support ** (the added amount of CEA)
[0095] 4. It collected blood from 20 names including the blood collecting colon cancer patient. Blood collecting was carried out by the conventional approach (it extracts 2 or more mLs of whole blood from an elbow culmination vein using the syringe for blood collecting) from the example 1 written approach (from a fingertip to blood collecting), and the elbow culmination vein. After putting the whole blood extracted from the elbow culmination vein at a room temperature for 1 hour or more, cooling centrifugal [of it] was carried out for 1500 G or 10 minutes with the refrigerated centrifuge, and it isolated the supernatant liquid (blood serum) part preparatively further.
[0096] 5. Blood support support (blood desiccation filter paper) was created like the approach of creation example 1 publication of blood support support (blood desiccation filter paper). The drying time was made into the 1 same hour as the case of extractability setting out.
[0097] 6. Extract and CEA density measurement were carried out by the approach same about an extract and quantum blood support support as the case of extractability setting out. It measured the condition as the description which is "SUFI alite CEA" of example 2 publication, and was attached to the measurement reagent on the other hand about the blood serum extracted and separated by the conventional approach (amount of specimens 40microL).
[0098] 7. CEA concentration in the extract prepared from the decision blood support support of the CEA concentration in blood was **(ed) by extractability (0.0199), and it asked for the CEA concentration in blood. The concentration of CEA in the blood serum for which it asked by the conventional approach, and the CEA concentration in the blood for which it asked by the approach of this invention were shown in a table 35. Moreover, the correlation diagram of the CEA concentration by the approach of this invention and the CEA concentration by the conventional method was shown in drawing 2 using these values. The CEA concentration in the blood serum in a conventional method and the CEA concentration in blood by the approach of this invention showed good functionality so that drawing 2 might show. A formula shows a correlation type (X: CEA concentration in a conventional method, CEA concentration in the approach of Y:this invention) among drawing 2 , and R shows a correlation coefficient.
[0099]
[A table 35]

単位：ｎｇ／ｍＬ

被検者	従来法による ＣＥＡ濃度	本発明の定量方法 抽出液中のＣＥＡ濃度	血液中のＣＥＡ濃度
1	0．8	0．002	0．10
2	2．3	0．042	2．11
3	5．6	0．121	6．08
4	8．4	0．173	8．69
5	82．1	1．630	81．91
6	20．8	0．403	20．25
7	69．7	1．346	67．64
8	0．6	0．011	0．55
9	3．4	0．071	3．57
10	1．8	0．035	1．76
11	1．4	0．024	1．21
12	3．6	0．073	3．67
13	1．1	0．021	1．06
14	4．3	0．087	4．37
15	2．8	0．051	2．56
16	6．3	0．122	6．13
17	1．9	0．041	2．06
18	38．7	0．809	40．65
19	2．3	0．045	2．25
20	4．8	0．088	4．41

[0100] It is shown that <example 6> this example has 19 to CA9 concentration for which it asked by the approach of this invention, and 19 to CA9 concentration by the conventional approach in a good correlation.
1. From five creation volunteers (subject G-K) of Standard C A19-9 addition blood support support, blood 1.8mL was extracted, it divided [0.9mLx2], and 100microL, in addition Standard C A19-9 addition blood were prepared for Standard C A19-9 solution (0 or 200 U/mL) of a "SUFI alite CA19-9 control set" to one of these, respectively. 100micro (200 U/mL) of Standard C A19-9 addition blood was dropped at the filter paper (BFC180, Watt Mann, Inc. make) L times, it dried at the room temperature (25**2 degrees C) for 1 hour, and Standard C A19-9 addition blood support support ** was created. Similarly, 100micro (0 U/mL) of blood L of the method of other 1 was dropped and dried at the filter paper, and blood support support ** was created.
[0101] 2. Like the extract approach of an extract and measurement example 3 publication, the extract was prepared, respectively from Standard C A19-9 addition blood support support ** and blood support support **, and 19 to CA9 concentration in an extract was measured. Those results were shown in a table 36.
[0102]
[A table 36]

被検者	抽出液中のCA19-9濃度（Ｕ／ｍｌ） 標準CA19-9添加血液担持担体①（A）	標準CA19-9添加血液担持担体②（B）	Ｂ－Ａ	抽出率 (Ｂ－Ａ)／２０
G	0．804	1．211	0．407	0．0204
H	0．326	0．732	0．406	0．0203
I	0．081	0．493	0．412	0．0206
J	0．160	0．572	0．412	0．0206
K	0．042	0．448	0．406	0．0203
平均	0．283	0．691	0．409	0．0204

[0103] 3. Extractability was computed from the degree type from the measured value shown in the menue 36 of extractability. Those results were shown in a table 36. The average of the extractability in five persons' blood was set up as extractability (0.0204) at the time of creating and extracting on these conditions.
extractability = (B-A) — CA 19-9 in the extract prepared from /CA:blood support support ** — CA19-9 concentration C:20 U/mL (19 to CA9 added amount) in the extract prepared from concentration B:Standard C A19-9 (200 U/mL) addition blood support support
[0104] 4. It collected blood from 20 names including the blood collecting pancreas cancer patient. Blood collecting was carried out by the conventional approach (it extracts 2 or more mLs of whole blood from an elbow culmination vein using the syringe for blood collecting) from the example 1 written approach (from a fingertip to blood collecting), and the elbow culmination vein. After putting the whole blood extracted from the elbow

culmination vein at a room temperature for 1 hour or more, cooling centrifugal [of it] was carried out for 1500 G or 10 minutes with the refrigerated centrifuge, and it isolated the supernatant liquid (blood serum) part preparatively further.
[0105] 5. Blood support support (blood desiccation filter paper) was created like the approach of creation example 1 publication of blood support support (blood desiccation filter paper). The drying time was made into the 1 same hour as the case of extractability setting out.
[0106] 6. Extract and 19 to CA9 density measurement were carried out by the approach same about an extract and quantum blood support support as the case of extractability setting out. It measured the condition as the description which is "SUFI alite CA 19-9" of example 3 publication, and was attached to the measurement reagent on the other hand about the blood serum extracted and separated by the conventional approach (amount of specimens 10microL).
[0107] 7. 19 to CA9 concentration in the extract prepared from the decision blood support support of 19 to CA9 concentration in blood was **(ed) by extractability (0.0199), and it asked for 19 to CA9 concentration in blood. The concentration of CA 19-9 in the blood serum for which it asked by the conventional approach, and 19 to CA9 concentration in the blood for which it asked by the approach of this invention were shown in a table 37. Moreover, the correlation diagram of 19 to CA9 concentration by the approach of this invention and 19 to CA9 concentration by the conventional method was shown in drawing 3 using these values. 19 to CA9 concentration in the blood serum in a conventional method and 19 to CA9 in blood concentration by the approach of this invention showed good functionality so that drawing 3 might show. A formula shows a correlation type (X: 19 to CA9 concentration in a conventional method, 19 to CA9 concentration in the approach of Y:this invention) among drawing 2 , and R shows a correlation coefficient.
[0108]
[A table 37]

単位：U／mL

被検者	従来法による CA19-9濃度	本発明の定量方法 抽出液中のCA19-9濃度	血液中のCA19-9濃度
1	43.5	1.010	49.51
2	20.4	0.531	26.03
3	1.0	0.022	1.08
4	0.8	0.013	0.64
5	53.7	1.030	50.49
6	12.0	0.317	15.54
7	5.6	0.116	5.69
8	125.3	2.345	114.95
9	7.9	0.071	3.48
10	4.8	0.092	4.51
11	23.5	0.421	20.64
12	38.9	0.773	37.89
13	65.2	1.445	70.83
14	13.7	0.216	10.59
15	48.6	1.123	55.05
16	95.0	2.090	102.45
17	186.9	4.004	196.27
18	21.6	0.509	24.95
19	4.8	0.094	4.61
20	15.7	0.287	14.07

[0109]
[Effect of the Invention] According to the quantum approach of the tumor marker in the blood of this invention, the quantum of the tumor marker of digestive system cancer and the tumor marker of hepatic carcinoma can be carried out very simply. Furthermore, since it can collect blood for subject itself, the expert for blood collecting etc. is unnecessary, and since the subject is blood collecting, it also has the simple nature that it is not necessary to go to a hospital etc. Moreover, since blood support support can be conveyed easily, many specimens can be brought together in one place, and it can measure them, and has the effectiveness of being able to reduce the cost of transport and measurement. Therefore, the quantum approach of this invention is the optimal when collecting and measuring many specimens, such as a medical checkup of digestive system cancer and hepatic carcinoma, from a large area.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the tumor marker quantum approach in blood. It is related with the tumor marker quantum approach in the blood used for a diagnosis of digestive system cancer and hepatic carcinoma in more detail.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] The syringe for blood collecting is conventionally used as the quantum approach of the tumor marker of digestive system cancer and hepatic carcinoma. After extracting 2 or more mLs of whole blood and mainly putting at a room temperature from a patient's elbow culmination vein for 1 hour or more, Cooling centrifugal is carried out for 1500 G or 10 minutes with a refrigerated centrifuge, a blood serum part and a clot part are divided, a supernatant liquid (blood serum) part is isolated preparatively in another test tube, and the approach of making this a measurement specimen and carrying out a quantum etc. is learned (for example, a clinical laboratory test manual, 1988, ******, 311-316 pages). In order to further usually measure efficiently, the approach of freezing or refrigeration saving a measurement specimen and carrying out the quantum of the measurement specimen of a constant rate collectively etc. is learned (for example, immunoassay, 1984, JIEI em C, 173-174 pages).

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] According to the quantum approach of the tumor marker in the blood of this invention, the quantum of the tumor marker of digestive system cancer and the tumor marker of hepatic carcinoma can be carried out very simply. Furthermore, since it can collect blood for subject itself, the expert for blood collecting etc. is unnecessary, and since the subject is blood collecting, it also has the simple nature that it is not necessary to go to a hospital etc. Moreover, since blood support support can be conveyed easily, many specimens can be brought together in one place, and it can measure them, and has the effectiveness of being able to reduce the cost of transport and measurement. Therefore, the quantum approach of this invention is the optimal when collecting and measuring many specimens, such as a medical checkup of digestive system cancer and hepatic carcinoma, from a large area.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] There was a problem to which cost — actuation of separating supernatant liquid from much blood when collecting blood from many subject and measuring the tumor marker in blood, such as a medical checkup, is required in the conventional approach, and there is the need of conveying and saving the separated blood serum by refrigeration or refrigeration with a test tube — becomes high. That is, the object of this invention is offering the approach of carrying out the quantum of the tumor marker of digestive system cancer, and the tumor marker of hepatic carcinoma simply.

[Translation done.]

MEANS

[Means for Solving the Problem] As a result of inquiring wholeheartedly that the above-mentioned object should be attained, by using a specific approach, this invention person found out that the quantum of the tumor marker of digestive system cancer and the tumor marker of hepatic carcinoma could be carried out simply, and reached this invention. That is, this invention is the tumor marker quantum approach in the blood characterized by extracting a constituent of blood from blood support support, and carrying out the quantum of the tumor marker of the digestive system cancer in blood, or the tumor marker of hepatic carcinoma from this extract constituent of blood.

[0005]

[The gestalt of invention implementation] The tumor marker (antigen) in this invention is a tumor marker for diagnosing digestive system cancer and/or hepatic carcinoma. As digestive system cancer, an esophagus cancer, gastric cancer, duodenal cancer, small intestinal cancer, colon cancer, rectal cancer, a pancreatic cancer, a gall bladder cancer, etc. are mentioned. It is duodenal cancer, small intestinal cancer, colon cancer, rectal cancer, a pancreatic cancer, and a gall bladder cancer preferably among these, and is colon cancer, rectal cancer, a pancreatic cancer, and a gall bladder cancer still more preferably, and they are colon cancer, a pancreatic cancer, and a gall bladder cancer especially preferably.

[0006] As a tumor marker of digestive system cancer, the following are mentioned, for example. In the case of an esophagus cancer, they are a carcinoembryonic antigen (CEA), IAP, ferritin, polyamine, beta 2-microglobulin, POA, a trypsin inhibitor, etc. In the case of gastric cancer, they are alpha fetoprotein (AFP), CEA and CA 19-9, KMO-1, DuPAN-2, SPan-1, CA50, SLX and CA 72-4, IAP and TPA, polyamine, beta 2-microglobulin, ferritin, POA, a trypsin inhibitor, etc. In the case of duodenal cancer, small intestinal cancer, colon cancer, and rectal cancer, they are CEA, CA 19-9, KMO-1, SPan-1, CA50, SLX and CA 72-4, IAP and TPA, beta 2-microglobulin, ferritin, POA, a trypsin inhibitor, etc.

[0007] In the case of a gall bladder cancer, they are AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, CA50 and CA 72-4, basic fetoprotein (BFP), NCC-ST -439, IAP and TPA, beta 2-microglobulin, ferritin, PIVKA-II, POA, a trypsin inhibitor, etc. In the case of a pancreatic cancer, they are CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, CA50 and CA 72-4, BFP, IAP and TPA, beta 2-microglobulin, ferritin, POA, a trypsin inhibitor, elastase 1, etc.

[0008] As a tumor marker of hepatic carcinoma, AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, CA50 and SLX, basic fetoprotein (BFP), NCC-ST -439, an alkaline phosphatase isozyme, a gamma-glutamyl transpeptidase isozyme, IAP and TPA, beta 2-microglobulin, ferritin, PIVKA-II, POA, a trypsin inhibitor, etc. are mentioned, for example. Among these tumor markers, preferably AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, SLX, CA50, CA 72-4, BFP, IAP and TPA, beta 2-microglobulin, They are ferritin, POA, a trypsin inhibitor, elastase 1, and PIVKA-II. It is AFP, CEA, CA 19-9, KMO-1, DuPAN-2, SPan-1, SLX and CA 72-4, BFP, IAP, TPA and POA, and PIVKA-II still more preferably, and they are AFP, CEA, and CA 19-9 especially preferably.

[0009] In the quantum approach of the tumor marker in the blood of this invention, although the quantum of one sort of tumor markers may be carried out and the quantum of two or more sorts of tumor markers may be carried out, carrying out the quantum of two or more sorts of tumor markers from the sensibility of a cancer diagnosis and a viewpoint of singularity is carrying out the quantum of 2-3 sorts of tumor markers desirable still more preferably. Although it can choose from the above-mentioned tumor marker suitably in order to carry out the quantum of two or more sorts of tumor markers From the tumor marker which consists of the case, for example, AFP, PIVKA-II, and CEA of hepatic carcinoma In the case of colon cancer (for example, the tumor marker which consists of CEA and CA 19-9) From the tumor marker which consists of the case 19-9, for example, CA, and CEA of a pancreatic cancer From the tumor marker which consists of a case of an esophagus

cancer, for example, a carcinoembryonic antigen, (CEA), and POA From the case of gastric cancer, for example, alpha fetoprotein, (AFP), and the tumor marker which consists of CEA and CA 19-9 In the case of duodenal cancer, small intestinal cancer, and rectal cancer (for example, the tumor marker which consists of CEA and CA 19-9) It is desirable to choose in the case of a gall bladder cancer (for example, the tumor marker which consists of AFP, CEA, and CA 19-9), and also when it is any of digestive system cancer and/or hepatic carcinoma, it is still more desirable to choose from the tumor marker which consists of AFP, CEA, and CA 19-9.

[0010] Although it is naturally also possible to use for this invention some blood which a limit does not have at least the doner site in the extraction approach etc., and obtained at least the conventional doner site by the extraction approaches (for example, using the syringe for blood collecting mainly an elbow culmination vein 2 or more mLs extraction of whole blood etc.), the blood in blood support support This blood has the desirable extraction from the deletion blood vessel from a viewpoint of reduction of the invasiveness to the subject. The blood which carried out the puncture of an earlobe or the fingertip from a viewpoint of invasiveness reduction of the subject, and was extracted also in the extraction from a deletion blood vessel is more desirable. Especially the blood that carried out the puncture of the fingertip and extracted it from viewpoints, such as a point which the point that the subject can extract blood by itself, a point with little full realization at the time of a puncture, and blood tend to extract as a drop (dropping), is desirable.

[0011] Although there will be especially no limit as an approach of extracting peripheral blood liquid if blood is extractable, the method of massaging and/or warming, congesting well, the parts (for example, an earlobe, a fingertip, etc.) concerned of the subject before a puncture, wiping a site of puncture, making it dry with disinfected gauze for example, carrying out the puncture of the part concerned by disposable Lancet etc., and obtaining blood from a viewpoint that it can carry out for subject itself etc. is desirable.

[0012] Although the construction material of support, especially a configuration, etc. are not restricted as long as it is possible as support in blood support support to hold blood, maintenance of the blood by adsorption is easy, it is desirable that they are the construction material and the configuration where a constituent of blood tends to be eluted by extract, and it is still more desirable that it is an absorber from a viewpoint that maintenance by adsorption is easy. As construction material of support, well-known naturally-ocurring polymers, synthetic macromolecule, etc. can be used, for example, cotton, wool, a cellulose, polystyrene, polyolefine, polyurethane, a nitrocellulose, cellulose acetate, polyester, an epoxy resin, phenol resin, silk, a fibroin, a lignin, a hemicellulose, a chitin, ebonite, rubber, glass, a quartz, the ceramics, etc. are mentioned. In these, naturally-ocurring polymers are a cellulose and cotton desirable still more preferably, and it is a cellulose especially preferably.

[0013] The absorber which consists of filter paper [which can use a well-known thing as support, for example, consists of the above-mentioned construction material etc.], nonwoven fabric, textile-fabrics, or sheet-like foam etc. is mentioned. Although the aperture of an absorber can carry out setting-out selection freely, the range of an average aperture has desirable 1-100 micrometers, and is 2-80 micrometers more preferably, and the range of it is 5-50 micrometers especially preferably. As a filter paper, it is JIS, for example. The filter paper specified to P3801 (1995) or TAPPI(Technical Association of the Pulp and Paper Industry) T205 is mentioned. As a nonwoven fabric, a polyolefine nonwoven fabric, a nitrocellulose nonwoven fabric, a cel SOL acetate nonwoven fabric, a polyester nonwoven fabric, an epoxy nonwoven fabric, a nonwoven glass fabric, a ceramic nonwoven fabric, etc. are mentioned, for example. As textile fabrics, a cheesecloth, wool cloth, a cellulose cloth, a polyolefine cloth, a nitrocellulose cloth, cel roll acetate cloth, an epoxy cloth, a glass fabric, a ceramic cloth, etc. are mentioned, for example.

[0014] As sheet-like foam, form polystyrene, foaming polyolefine, foaming polyurethane, foaming polyester, a foaming epoxy resin, foam glass, the foaming ceramics, etc. are mentioned, for example. the viewpoint (improvement in quantum precision) that an amount tends to become fixed to the filter paper, nonwoven fabric, and sheet-like foam of the blood absorbed to per unit volume or unit area in these — desirable — further — desirable — a filter paper and a nonwoven fabric — it is a filter paper, a polyolefine nonwoven fabric, a nitrocellulose nonwoven fabric, a cel SOL acetate nonwoven fabric, a polyester nonwoven fabric, an epoxy nonwoven fabric, a nonwoven glass fabric, and a ceramic nonwoven fabric especially preferably, and is a filter paper most preferably.

[0015] Although thickness, such as filter paper, nonwoven fabric, textile-fabrics, or sheet-like foam, can be chosen suitably, 0.1-3.0mm is 0.3-0.6mm especially preferably 0.2-1.0mm desirable still more preferably. although magnitude (area), such as filter paper, nonwoven fabric, textile-fabrics, or sheet-like foam, can be freely set up in consideration of the operability at the time of blood collecting, storage, and transport etc. — 1-200cm2 —

desirable — further — desirable — 10-150cm2 — it is 2 25-100cm especially preferably.
[0016] The support to the support of blood will not be restricted especially if blood can be held, but it can make support support blood by contacting support and blood. As an approach of contacting support and blood, the approach of forcing support on the approach immersed in blood in support, the approach of trickling blood into support, and the puncture section etc. is mentioned, for example. The approach of forcing support on the approach and the puncture section which trickle blood into support from a viewpoint of simple nature among these is the approach of trickling blood into support desirable still more preferably.
[0017] Although the amount of the blood used is an amount in which support can be immersed and it is decided that it will be the magnitude of support when support is immersed in blood, 0.1-1ml 0.05-2ml is 0.15-0.5ml especially preferably desirable still more preferably. Although the amount of the blood used is determined as the magnitude of support when blood is dropped at support, 0.05-0.3ml 0.02-0.5ml is 0.1-0.2ml especially preferably desirable still more preferably. Although the amount of the blood used is determined as the magnitude of support when forcing support on the puncture section, 0.05-0.3ml 0.02-0.5ml is 0.1-0.2ml especially preferably desirable still more preferably.
[0018] When cutting off the blood support part of blood support support in fixed magnitude (after-mentioned), what is necessary is just to drop the blood more than the amount which can hold the support cut off, and it is not necessary to control the dropped blood volume to accuracy. For example, if the blood volume which the filter paper trickled in Watt Mann BFC180 (0.49mm in thickness) is 50microL, the magnitude of the part holding blood is about 12mm in diameter. Since one drop of volume is about 40-60microL, with a diameter of 6mm when piercing circularly, the amount of required blood becomes 1-2 drops about a blood support part.
[0019] Furthermore, after making blood hold from a viewpoint of the stability of blood, and the repeatability of a quantum to support, it is desirable to make it dry and it is still more desirable to dry until the weight of the blood held at support becomes 50 or less (preferably 30 or less % of the weight) % of the weight. As the desiccation approach, reduced pressure drying, frozen reduced pressure drying, fine stoving, simple desiccation (air dried), etc. can be applied, reduced pressure drying, frozen reduced pressure drying, and simple desiccation are reduced pressure drying and simple desiccation desirable still more preferably among these, for example, and it is simple desiccation especially preferably.
[0020] It is desirable to carry out on the conditions from which antigenic [of a tumor marker] does not change, it is still more desirable especially desirable to carry out at the temperature of 40 degrees C or less, and desiccation is performed at 10-30 degrees C. When decompressing, 0.05-2Pa 0.02-10Pa is 0.1-1Pa especially preferably desirable still more preferably. 10 - 90%RH is desirable still more desirable, and the humidity in the case of carrying out simple desiccation is 40 - 80%RH, although there is especially no limit. Although it can set up suitably with the configuration of support, and the held blood volume, the drying time is 20 minutes - about 1 hour, when support is a filter paper.
[0021] the case where a blood hold back carrier is saved — humidity — below 80%RH — desirable — further — desirable — 10 - 60%RH — it is 20 - 40%RH especially preferably, and 0-40 degrees C is desirable still more desirable, and 2-30 degrees C of temperature are 2-10 degrees C especially preferably. In addition, if it is in the condition which can maintain 80% below of humidity RH (sealing lower of drying-agent existence under sealing etc.), mail or parcel delivery service can convey.
[0022] It is desirable to carry out, after cutting off the blood support part of blood support support in fixed magnitude before the extract of a constituent of blood. For example, blood is dropped at a uniform absorber, and after making a perimeter carry out diffusion absorption and drying, the method of using for an extract what cut off the core in the fixed configuration is desirable [superfluous blood]. The approach of starting as an approach of cutting off along with the approach and the cutoff lines put in beforehand (perforation etc.) pierced by punch of a fixed diameter etc. is applicable.
[0023] Unless, as for the extract of blood support support to a constituent of blood, antigenic [of the tumor marker in blood (antigen)] changes, it can carry out that there is especially no limit, for example, blood support support can be immersed in the solution for an extract, and the supernatant liquid can be used as an extract. As a solution for an extract, pH can use the buffer solution of a neutral region, for example, the good buffer solution of pH 6-8, the phosphate buffer solution of pH 6-8, etc. are used preferably.
[0024] Moreover, a salt, a surfactant, protein, an antigen stabilizing agent, etc. can also be added in the solution for an extract. As a salt, a sodium chloride, potassium chloride, a lithium bromide, etc. are mentioned, for example. As a surface active agent, nonionic surface active agents, such as a sorbitan lauric-acid monoester ethylene oxide addition product (for example, Tween 20 and Tween 40 (the ICI United States)), etc. are

mentioned, for example. As protein, cow serum albumin, casein, etc. are mentioned, for example. As an antigen stabilizing agent, a chelating agent, protease inhibitor, etc., such as EDTA, are mentioned, for example.
[0025] It is necessary to make regularity extraction conditions, such as the amount of the solution for an extract used to support, and extract time amount, from a viewpoint of quantum repeatability. As amount of the solution for an extract used, 0.1-1ml 0.05-5ml is 0.2-0.5ml especially preferably desirable still more preferably. As extract time amount, 0.5 - 480 minutes is 5 - 60 minutes especially preferably desirable still more preferably for 1 to 180 minutes. As for churning, it is desirable to shake and to perform a container using equipment like a vortex mixer, and the count of a shock has desirable 100 - 2000rpm.
[0026] For example, in the case of a filter paper (Watt Mann BFC180) with a diameter [cut out of blood support support] of 6mm (0.49mm in thickness), it can extract on condition that the following etc.
The solution presentation for an extract: 0.05 mols of sodium chloride content, L phosphate buffer solution (pH7.2) (the content of a sodium chloride: it is the same 0.85g per buffer-solution 100mL, and the following.)
Amount-used:200 which is a solution for an extract - 300microL extract temperature: Room temperature (15-25 degrees C)
Extract time amount: 20 minutes - 1 hour (neglect time amount after stirring)
Extract operation: Add the solution for an extract to support and carry out the above-mentioned time amount neglect at the above-mentioned temperature after stirring (500rpm, 1 minute) with a vortex mixer. It stirs again (they are 500rpm and 5 seconds with a vortex mixer), and after putting for 1 minute and making dispersed filter paper fiber sediment, digestive liquor is extracted and it uses as a specimen for tumor marker measurement (extract).
[0027] Although especially the quantum approach of the tumor marker in the above-mentioned extract is not restricted, the repeatability of a quantum value and the viewpoint of sensitometry to immunoassay is desirable. Although a conventionally well-known approach can be used as immunoassay, since the tumor marker concentration in an extract is lower than the concentration in blood, a measuring method with high quantum sensibility is desirable, for example, the radioimmunoassay (RIA), enzyme immunoassay (EIA), fluorescence immunoassay (FIA), and chemiluminescence immunoassay (CLIA) are desirable.
[0028] 2 part sandwiches measuring method using the solid phase antibody and I125 labelled antibody as radioimmunoassay (RIA) etc. is mentioned, and many measurement reagent kits are marketed. 2 part sandwiches measuring method using the solid phase antibody and the enzyme labelled antibody as enzyme immunoassay (EIA) etc. is mentioned, and the various measurement reagent kits using a peroxidase, the alkaline phosphatase, glucose oxidase, etc. as an enzyme are marketed. 2 part sandwiches measuring method using the solid phase antibody and the europium labelled antibody as fluorescence immunoassay (FIA) etc. is mentioned. 2 part sandwiches measuring method using the solid phase antibody and the acridinium ester labelled antibody as chemiluminescence immunoassay (CLIA) etc. is mentioned, and various measurement reagent kits are marketed. Such desirable immunoassay is enzyme immunoassay (EIA), and it is chemiluminescence enzyme immunoassay (CLEIA) still more preferably.
[0029] From the tumor marker concentration in an extract, the approach using the calibration curve created using the blood support support with which the method of asking for the concentration of the tumor marker in blood could apply various approaches, for example, the concentration of (1) tumor marker supported known blood, the approach using the calibration curve which the concentration of (2) tumor markers created using the known extract, and the extractability of a tumor marker, etc. are mentioned.
[0030] In the approach of (2), extractability creates blood support support using the blood containing the tumor marker of known concentration, carries out the quantum of the content of the tumor marker in the extract extracted from now on, asks for the concentration of the tumor marker of an extract, and is called for from a degree type. As for extractability, it is desirable to perform the above actuation twice [at least] (preferably at least 3 times), and to use those averages.
Extractability =(concentration of tumor marker of extract)/(concentration of the tumor marker of blood)
the tumor marker concentration in the extract by which the tumor marker concentration in the blood of a specimen is prepared from a specimen — extractability — **** — although it can ask by things, the conditions of creation of blood support support and an extract need to be the same conditions as the time of asking for extractability in that case.
[0031] In addition, since the tumor marker by which a quantum is carried out by this invention exists by super-low concentration in blood, fluctuation of the extractability by fluctuation of concentration is very slight, for example, in the case of AFP, can use the same extractability in the range of 0.5 - 1,000 ng/mL. In the case of

the high-concentration specimen exceeding 1,000 ng/mL, the extractability for which it asked may differ from actual extractability, but clinical decision is not influenced (that is, in the case of AFP, the boundary concentration of cancer decision is 10 ng/mL, and if it is over 1,000 ng/mL, in cancer decision, it is a positivity.).

[0032] Moreover, in the case of CEA, the same extractability can be used in the range of 0.5 - 200 ng/mL. In the case of the high-concentration specimen exceeding 200 ng/mL, the extractability for which it asked may differ from actual extractability, but clinical decision is not influenced (that is, in the case of CEA, the boundary concentration of cancer decision is 5 ng/mL, and if it is over 200 ng/mL, in cancer decision, it is a positivity.). tumor markers other than AFP and CEA — the same — the concentration of a tumor marker — clinical decision is not influenced

[0033] (1) And as for the blood or the extract in which the tumor marker of known concentration is included in any [of the approach of (2)] case, it is desirable to use two or more sorts from which concentration differs. Although the concentration of the blood containing the tumor marker of known concentration or an extract can be freely set up according to the class of tumor marker to measure Usually, since a cut-off is usually before and after 10 ng/mL when it is desirable to set up by the concentration to which possibility of being healthy people's range (normal region) and cancer can measure clearly boundary concentration (cut-off) with the high range, for example, it is AFP, As for the blood containing the tumor marker of known concentration, in the case of the approach of (1), it is desirable to carry out 2 concentration (for example, 5 or more ng/mL [of concentration of less than 10 ng/mL], 10 or more ng/mL concentration of less than 50 ng/mL) setting out on both sides of 10 ng/mL at least. Moreover, in the case of the approach of (2), since it is the concentration of the tumor marker in an extract, it is desirable to set it as 2 concentration (for them to be 0.1 or more ng/mL of concentration of less than 0.2 ng/mL, and 0.2 or more ng/mL the concentration of less than 1 ng/mL, since concentration 10 ng/mL in blood is equivalent to concentration 0.2 ng/mL in an extract when extractability is 0.02) which took extractability into consideration based on 10 ng/mL.

[0034] Moreover, since a cut-off is usually before and after 5 ng/mL in the case of CEA, in the case of the approach of (1), it is desirable [the blood containing the tumor marker of known concentration] to carry out 2 concentration (for example, 2 or more ng/mL [of concentration of less than 5 ng/mL], 5 or more ng/mL concentration of less than 25 ng/mL) setting out on both sides of 5 ng/mL at least. Moreover, in the case of the approach of (2), since it is the concentration of the tumor marker in an extract, it is desirable to set it as 2 concentration (for them to be 0.05 or more ng/mL of concentration of less than 0.1 ng/mL, and 0.1 or more ng/mL the concentration of less than 0.5 ng/mL, since concentration 5 ng/mL in blood is equivalent to concentration 0.1 ng/mL in an extract when extractability is 0.02) which took extractability into consideration based on 5 ng/mL.

[0035] Moreover, since a cut-off is usually before and after 37 U/mL in the case of CA 19-9, in the case of the approach of (1), it is desirable [the blood containing the tumor marker of known concentration] to carry out 2 concentration (for example, 5 or more U/mL [of concentration of less than 37 U/mL], 37 or more U/mL concentration of less than 100 U/mL) setting out on both sides of 37 U/mL at least. Moreover, in the case of the approach of (2), since it is the concentration of the tumor marker in an extract, it is desirable to set it as 2 concentration (for them to be 0.1 or more U/mL of concentration of less than 0.74 U/mL, and 0.74 or more U/mL the concentration of less than 2.0 U/mL, since concentration 37 U/mL in blood is equivalent to concentration 0.74 U/mL in an extract when extractability is 0.02) which took extractability into consideration based on 37 U/mL.

[0036] When the cut-offs of tumor markers other than AFP, CEA, and CA19-9 are enumerated, they are IAP:501microg/mL, ferritin:200 ng/mL, a polyamine:45micromol/g creatinine, POA:20 U/mL, KMO-1:600 U/mL, DuPAN-2:400 U/mL, CA50:36 U/mL, CA72-4:4 U/mL, TPA:130 U/L, and PIVKA-II:0.1 AU/mL, for example.

[0037] By the approach of (1), since the blood the point which needs to be carried out to creation of a calibration curve from extract operation, and for calibration-curve creation cannot be saved for a long period of time, there is troublesomeness created in the case of measurement, but even if it changes an extraction condition, there is the advantage in which exact measurement can be performed. On the other hand, the approach of (2) asks for extractability beforehand, and if conditions, such as extract operation, are fixed, it can measure a lot of specimens correctly and simple. (1) And the approach of of the viewpoint of simplicity to (2) is desirable among the approaches of (2).

[0038] The quantum approach of this invention is the optimal, when it can hold and dry, it can convey to blood collecting and support (for example, bringing, mail, parcel delivery service, etc.) and it collects and carries out the

quantum of many specimens to them from a large area like the medical checkup of digestive system cancer and hepatic carcinoma for subject itself. Moreover, also in the followup of the cancer treatment to the patient of a remote place besides an examination for cancer etc., it is applicable.

[Translation done.]

* NOTICES *

EXAMPLE

[Example] Hereafter, although an example explains this invention further, this invention is not limited to this.
[0040] Even if <example 1> this example saves blood support support for a long period of time, it shows that the quantum of the tumor marker (AFP) can be carried out to accuracy.
1. After it Massages and Warms and Congesting Well Fingertip of Six Creation Volunteers (Subject A-F) of Blood Collecting and Blood Support Support (Blood Desiccation Filter Paper), Wiping Site of Puncture and Making it Dry with Gauze for Disinfection A puncture is carried out by disposable Lancet (a trade name "HEMORETTO", Green Cross Corp. make), the first blood drop is wiped away, two drops of blood drops as follows were directly dropped at filter paper (lot number BFC180, Watt Mann, Inc. make) ******** for blood collecting of ten per subject, and it was made to absorb them from a fingertip. Subsequently, it was indoors (25**1 degree C, 65**5% RH) air-dry (the air-dried time amount 5, 20, 40, and 60 or 120 minutes), and blood support support (blood desiccation filter paper) was obtained. The weight of blood support support (blood desiccation filter paper) was measured for every **** time amount, and the ratio to initial blood weight (value except filter paper weight) was asked for aridity (average of two blood support support). This aridity was shown in a table 1. Subsequently, blood support support (blood desiccation filter paper) was saved on the preservation conditions of table 1 publication (preservation days 0, 3, 7, 14, and 28 days).
[0041]
[A table 1]

条件No.	乾燥時間（分）	乾燥度（%）	保存条件	
			温度（℃）	湿度（%RH）
1 a	5	7 8	4 ± 2	3 5 ± 5
1 b	5	7 8	2 5 ± 2	5 5 ± 5
2 a	2 0	4 7	4 ± 2	3 5 ± 5
2 b	2 0	4 7	2 5 ± 2	5 5 ± 5
3 a	4 0	3 4	4 ± 2	3 5 ± 5
3 b	4 0	3 4	2 5 ± 2	5 5 ± 5
4 a	6 0	2 8	4 ± 2	3 5 ± 5
4 b	6 0	2 8	2 5 ± 2	5 5 ± 5
5 a	1 2 0	2 6	4 ± 2	3 5 ± 5
5 b	1 2 0	2 6	2 5 ± 2	5 5 ± 5

[0042] 2. Actuation below extract operation was carried out in the interior of a room with a temperature of 20-25 degrees C. The core of the blood support part of each blood support support (blood desiccation filter paper) saved on condition that a table 1 was pierced by 1 hole punch (object marketed as an object for clerical work) with a diameter of 6mm, and the filter paper piece was obtained. 0.05 mols of sodium chloride content and filter paper piece and 250micro [of L phosphate buffer solutions] (pH7.2) (solution for extract) L pierced in the test tube were added, and after carrying out stirring (it is 500rpm with a vortex mixer) for 30 seconds, it was left for 30 minutes. Then, after stirring like for 30 seconds, it put for 1 minute, and supernatant liquid was isolated preparatively, the extract was prepared, and the quantum of a tumor marker was presented with this.
[0043] 3. As a reagent for quantum quanta of the tumor marker (AFP) in an extract, "SUFI alite AFP" put on the market by Wako Pure Chem Industries as a clinical laboratory test medicine was used. The "SUFI alite AFP control set" put on the market by Wako Pure Chem Industries was used for the standard solution for determining the amount of tumor markers in an extract. As a quantitative analyzing instrument, SphereLight180 by Olympus Optical Co., Ltd. was used. The quantum of AFP is made with chemiluminescence enzyme

immunoassay by using this reagent and equipment. The amount of specimens which is clinical laboratory test medicine for the reagent for quanta to be used to measure the tumor marker concentration in a blood serum, and is usually used for measurement is set as 10microL, it gets down, and reaction time is total about 15 minutes. Since it was low concentration from the inside of a blood serum in the case of the quantum of the tumor marker in an extract, 100microL activity of an extract was done.

[0044] 4. The stability for which it asked by the quantum result quantum result and the degree type was shown in tables 2-11.

(Stability) =(quantum value after predetermined retention period) x100/(initial quantum value)

In addition, after creating blood support support, the initial quantum value supplied blood support support to the solution for an extract promptly, started and carried out the quantum of the extract operation, and showed it as retention period zero day. The storage temperature of 4 degrees C showed and the tumor marker (antigen: AFP) in the extract obtained from the blood support support (blood desiccation filter paper) created and saved with the monograph affair showed the value of 90% or more of stability for seven days at 25 degrees C 28 days except for the case where the drying time is 5 minutes. Therefore, when the drying time was 20 minutes or more, it turned out that the tumor marker (antigen: AFP) in blood support support (blood desiccation filter paper) is stable.

[0045]

[A table 2]

条件No：1a

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.093	0.090	0.089	0.084	0.079	97	96	90	85
B	0.054	0.052	0.049	0.046	0.037	96	91	85	69
C	0.073	0.070	0.059	0.064	0.059	96	81	88	81
D	0.064	0.062	0.059	0.056	0.047	97	92	88	73
E	0.125	0.122	0.121	0.116	0.111	98	97	93	89
F	0.074	0.071	0.067	0.063	0.051	96	91	85	69
				平均		97	91	88	78

[0046]

[A table 3]

条件No：1b

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.094	0.085	0.076	0.045	0.039	90	81	48	41
B	0.053	0.042	0.036	0.026	0.018	79	68	49	34
C	0.074	0.065	0.056	0.025	0.019	88	76	34	26
D	0.063	0.052	0.046	0.036	0.028	83	73	57	44
E	0.126	0.177	0.108	0.077	0.071	93	86	61	56
F	0.073	0.058	0.050	0.036	0.025	79	68	49	34
				平均		85	75	50	39

[0047]

[A table 4]

条件No：2a

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.092	0.093	0.090	0.091	0.089	101	98	99	97
B	0.054	0.053	0.052	0.050	0.049	98	96	93	91
C	0.072	0.073	0.070	0.071	0.069	101	97	99	96
D	0.064	0.063	0.062	0.060	0.059	98	97	94	92
E	0.124	0.125	0.122	0.123	0.121	101	98	99	98
F	0.074	0.073	0.071	0.069	0.067	98	96	93	91
				平均		100	97	96	94

[0048]

[A table 5]
条件Ｎｏ：２ｂ

被検者	ＡＦＰ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.093	0.089	0.084	0.078	0.072	96	90	84	77
B	0.053	0.050	0.048	0.043	0.039	94	91	81	74
C	0.073	0.069	0.064	0.058	0.052	95	88	79	71
D	0.063	0.060	0.058	0.053	0.049	95	92	84	78
E	0.125	0.121	0.116	0.110	0.104	97	93	88	83
F	0.073	0.069	0.066	0.059	0.053	94	91	81	74
					平均	95	91	83	76

[0049]
[A table 6]
条件Ｎｏ：３ａ

被検者	ＡＦＰ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.094	0.093	0.093	0.091	0.092	99	99	97	98
B	0.052	0.053	0.052	0.051	0.050	102	100	98	96
C	0.074	0.073	0.073	0.071	0.072	99	99	96	97
D	0.062	0.063	0.061	0.060	0.059	102	98	97	95
E	0.126	0.125	0.125	0.123	0.124	99	99	98	98
F	0.071	0.073	0.071	0.070	0.069	102	100	98	96
					平均	101	99	97	97

[0050]
[A table 7]
条件Ｎｏ：３ｂ

被検者	ＡＦＰ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.092	0.089	0.086	0.082	0.078	97	93	89	85
B	0.054	0.052	0.050	0.049	0.047	96	93	91	87
C	0.072	0.069	0.066	0.062	0.058	96	92	86	81
D	0.064	0.062	0.060	0.059	0.057	97	94	92	89
E	0.124	0.121	0.118	0.114	0.110	98	95	92	89
F	0.074	0.071	0.069	0.067	0.064	96	93	91	87
					平均	97	93	90	86

[0051]
[A table 8]
条件Ｎｏ：４ａ

被検者	ＡＦＰ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.093	0.094	0.093	0.091	0.089	101	100	98	96
B	0.053	0.053	0.052	0.051	0.049	100	98	96	92
C	0.073	0.074	0.073	0.071	0.069	101	100	97	95
D	0.063	0.063	0.062	0.061	0.059	100	98	97	94
E	0.125	0.126	0.125	0.123	0.121	101	100	98	97
F	0.073	0.073	0.071	0.070	0.067	100	98	96	92
					平均	101	99	97	94

[0052]
[A table 9]

条件No：4b

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.093	0.089	0.087	0.085	0.081	96	94	91	87
B	0.052	0.050	0.048	0.047	0.045	96	92	90	87
C	0.073	0.069	0.067	0.065	0.061	95	92	89	84
D	0.062	0.060	0.058	0.057	0.055	97	94	92	89
E	0.125	0.121	0.119	0.117	0.113	97	95	94	90
F	0.071	0.069	0.066	0.064	0.062	96	92	90	87
					平均	96	93	91	87

[0053]
[A table 10]
条件No：5a

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.092	0.093	0.092	0.093	0.090	101	100	101	98
B	0.053	0.053	0.052	0.050	0.051	100	98	94	96
C	0.072	0.073	0.072	0.073	0.070	101	100	101	97
D	0.063	0.063	0.062	0.060	0.061	100	98	95	97
E	0.124	0.125	0.124	0.125	0.122	101	100	101	98
F	0.073	0.073	0.071	0.069	0.070	100	98	94	96
					平均	101	99	98	97

[0054]
[A table 11]
条件No：5b

被検者	AFP濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.094	0.090	0.089	0.086	0.082	96	95	91	87
B	0.053	0.050	0.050	0.048	0.048	94	94	91	91
C	0.074	0.070	0.069	0.066	0.072	95	93	89	97
D	0.063	0.060	0.060	0.058	0.058	95	95	92	92
E	0.126	0.122	0.121	0.118	0.114	97	96	94	90
F	0.073	0.069	0.069	0.066	0.066	94	94	91	91
					平均	95	95	91	91

[0055] Even if <example 2> this example saves blood support support for a long period of time, it shows by the case that the quantum of the tumor marker (CEA) can be carried out to accuracy.
1. Like the creation example 1 of blood collecting and blood support support (blood desiccation filter paper), blood support support (blood desiccation filter paper) was prepared from six volunteers (subject A-F), and it saved on the preservation conditions of table 1 publication (preservation days 0, 3, 7, 14, and 28 days).
2. Like the extract operation example 1, the extract was prepared and the quantum of a tumor marker was presented with this.
[0056] 3. The quantum measurement reagent of the tumor marker (CEA) in an extract used "SUFI alite CEA" put on the market by Wako Pure Chem Industries as a clinical laboratory test medicine. The "SUFI alite CEA control set" put on the market by Wako Pure Chem Industries was used for the standard solution for determining the amount of tumor markers in an extract. As a quantitative analyzing instrument, SphereLight180 by Olympus Optical Co., Ltd. was used. The quantum of CEA is made with chemiluminescence enzyme immunoassay by using this reagent and equipment. The amount of specimens which is clinical laboratory test medicine for the reagent for quanta to be used to measure the tumor marker concentration in a blood serum, and is usually used for measurement is set as 40microL, it gets down, and reaction time is total about 15 minutes. Since it was low concentration from the inside of a blood serum in the case of the quantum of the tumor marker in an extract, 100microL activity of an extract was done. Moreover, reaction time was extended in

29 minutes.

[0057] 4. The stability for which it asked like the quantum result quantum result and the example 1 was shown in tables 12-21. In addition, after creating blood support support, the initial quantum value supplied blood support support to the solution for an extract promptly, started and carried out the quantum of the extract operation, and showed it as retention period zero day. The storage temperature of 4 degrees C showed and the tumor marker (antigen: CEA) in the extract obtained from the blood support support (blood desiccation filter paper) created and saved with the monograph affair showed the value of 90% or more of stability for seven days at 25 degrees C 28 days except for the case where the drying time is 5 minutes. Therefore, when the drying time was 20 minutes or more, it turned out that the tumor marker (antigen: CEA) in blood support support (blood desiccation filter paper) is stable.

[0058]

[A table 12]

条件No：1a

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.045	0.044	0.040	0.036	95	93	85	76
B	0.063	0.060	0.055	0.049	0.034	94	86	78	53
C	0.063	0.060	0.059	0.054	0.049	95	94	86	78
D	0.034	0.032	0.029	0.026	0.017	94	85	76	50
E	0.135	0.130	0.129	0.120	0.112	96	95	89	83
F	0.055	0.051	0.047	0.042	0.027	94	85	76	49
					平均	95	90	82	65

[0059]

[A table 13]

条件No：1b

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.040	0.034	0.017	0.012	85	71	35	24
B	0.061	0.042	0.032	0.014	0.018	69	52	24	29
C	0.063	0.054	0.046	0.025	0.019	86	73	40	30
D	0.033	0.022	0.016	0.006	0.008	67	48	18	24
E	0.135	0.120	0.107	0.072	0.062	89	79	53	46
F	0.053	0.035	0.025	0.009	0.012	66	48	17	23
					平均	77	62	31	29

[0060]

[A table 14]

条件No：2a

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.047	0.048	0.045	0.046	0.044	102	96	98	95
B	0.063	0.061	0.060	0.058	0.058	97	94	92	92
C	0.062	0.063	0.060	0.061	0.059	102	97	98	95
D	0.034	0.033	0.032	0.031	0.031	97	94	91	91
E	0.134	0.135	0.130	0.132	0.129	101	97	99	96
F	0.055	0.053	0.051	0.050	0.050	97	94	91	91
					平均	99	95	95	93

[0061]

[A table 15]

条件Ｎｏ：２ｂ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.044	0.043	0.038	0.032	93	90	79	67
B	0.061	0.058	0.056	0.053	0.046	94	92	86	75
C	0.063	0.059	0.057	0.051	0.044	94	90	81	70
D	0.033	0.031	0.030	0.028	0.024	94	91	85	73
E	0.135	0.129	0.125	0.115	0.103	95	93	85	77
F	0.053	0.050	0.048	0.045	0.038	94	91	85	72
					平均	94	91	84	72

[0062]

[A table 16]

条件Ｎｏ：３ａ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.048	0.048	0.046	0.047	100	100	97	98
B	0.060	0.061	0.060	0.058	0.056	103	100	97	94
C	0.063	0.063	0.063	0.061	0.062	100	100	97	98
D	0.032	0.033	0.032	0.031	0.030	103	100	97	94
E	0.135	0.135	0.135	0.132	0.134	100	100	98	99
F	0.051	0.053	0.051	0.050	0.048	103	100	97	94
					平均	101	100	97	96

[0063]

[A table 17]

条件Ｎｏ：３ｂ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.047	0.044	0.043	0.039	0.035	95	91	82	75
B	0.063	0.060	0.058	0.055	0.051	94	92	86	81
C	0.062	0.059	0.057	0.052	0.048	95	92	84	77
D	0.034	0.032	0.031	0.029	0.027	94	91	85	79
E	0.134	0.129	0.125	0.117	0.110	96	94	87	82
F	0.055	0.051	0.050	0.047	0.043	94	91	85	79
					平均	95	92	85	79

[0064]

[A table 18]

条件Ｎｏ：４ａ

被検者	ＣＥＡ濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.049	0.048	0.046	0.044	102	100	97	93
B	0.061	0.061	0.060	0.058	0.056	100	97	94	91
C	0.063	0.064	0.063	0.061	0.059	102	100	97	94
D	0.033	0.033	0.032	0.031	0.029	100	97	94	88
E	0.135	0.137	0.135	0.132	0.129	101	100	98	95
F	0.053	0.053	0.051	0.050	0.048	100	97	94	90
					平均	101	99	96	92

[0065]

[A table 19]

条件No：4b

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.048	0.044	0.043	0.041	0.038	93	90	86	79
B	0.060	0.056	0.055	0.051	0.048	94	91	85	80
C	0.063	0.059	0.057	0.055	0.051	94	90	87	81
D	0.032	0.030	0.029	0.027	0.025	94	91	84	78
E	0.135	0.129	0.125	0.122	0.115	95	93	90	85
F	0.051	0.048	0.047	0.043	0.040	94	90	84	78
					平均	94	91	86	80

[0066]
[A table 20]
条件No：5a

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.047	0.048	0.047	0.048	0.045	102	100	102	96
B	0.061	0.061	0.060	0.056	0.058	100	97	92	94
C	0.062	0.063	0.062	0.063	0.060	102	100	102	97
D	0.033	0.033	0.032	0.030	0.031	100	97	91	94
E	0.134	0.135	0.134	0.135	0.130	101	100	101	97
F	0.053	0.053	0.051	0.048	0.050	100	97	91	94
					平均	101	99	97	95

[0067]
[A table 21]
条件No：5b

被検者	CEA濃度(ng/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.049	0.045	0.044	0.042	0.039	93	92	86	80
B	0.061	0.058	0.056	0.055	0.053	94	92	89	86
C	0.064	0.060	0.059	0.056	0.052	94	92	88	81
D	0.033	0.031	0.030	0.029	0.028	94	91	88	85
E	0.137	0.130	0.129	0.124	0.117	95	94	90	85
F	0.053	0.050	0.048	0.047	0.045	94	91	88	85
					平均	94	92	88	84

[0068] Even if <example 3> this example saves blood support support for a long period of time, it shows by the case that the quantum of the tumor marker (CA 19-9) can be carried out to accuracy.
1. Like the creation example 1 of blood collecting and blood support support (blood desiccation filter paper), blood support support (blood desiccation filter paper) was prepared from six volunteers (subject A-F), and it saved on the preservation conditions of table 1 publication (preservation days 0, 3, 7, 14, and 28 days).
2. Like the extract operation example 1, the extract was prepared and the quantum of a tumor marker was presented with this.
[0069] 3. The quantum measurement reagent of the tumor marker in an extract (CA 19-9) used "SUFI alite CA 19-9" put on the market by Wako Pure Chem Industries as a clinical laboratory test medicine. The "SUFI alite C19-9A control set" put on the market by Wako Pure Chem Industries was used for the standard solution for determining the amount of tumor markers in an extract. As a quantitative analyzing instrument, SphereLight180 by Olympus Optical Co., Ltd. was used. The quantum of CA 19-9 is made with chemiluminescence enzyme immunoassay by using this reagent and equipment.
[0070] The amount of specimens which is clinical laboratory test medicine for the reagent for quanta to be used to measure the tumor marker concentration in a blood serum, and is usually used for measurement is set as 10microL, it gets down, and reaction time is total about 15 minutes. Since it was low concentration from the inside of a blood serum in the case of the quantum of the tumor marker in an extract, 100microL activity of an extract was done. Moreover, reaction time was extended in 29 minutes.
[0071] 4. The stability for which it asked like the quantum result quantum result and the example 1 was shown in

tables 22-31. In addition, after creating blood support support, the initial quantum value supplied blood support support to the solution for an extract promptly, started and carried out the quantum of the extract operation, and showed it as retention period zero day. The storage temperature of 4 degrees C showed and the tumor marker (antigen: CA 19-9) in the extract obtained from the blood support support (blood desiccation filter paper) created and saved with the monograph affair showed the value of 90% or more of stability for seven days at 25 degrees C 28 days except for the case where the drying time is 5 minutes. Therefore, when the drying time was 20 minutes or more, it turned out that the tumor marker (antigen: CA 19-9) in blood support support (blood desiccation filter paper) is stable.

[0072]

[A table 22]

条件Ｎｏ：１ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	１４	２８	3	7	１４	２８
A	0.719	0.701	0.689	0.679	0.661	98	96	95	92
B	0.425	0.399	0.370	0.341	0.320	94	87	80	75
C	0.443	0.432	0.425	0.419	0.408	98	96	95	92
D	0.078	0.073	0.068	0.063	0.060	94	88	81	77
E	0.565	0.551	0.542	0.534	0.520	98	96	95	92
F	0.164	0.154	0.143	0.132	0.124	94	87	80	76
					平均	96	92	88	84

[0073]

[A table 23]

条件Ｎｏ：１ｂ

検者被	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	１４	２８	3	7	１４	２８
A	0.715	0.663	0.663	0.569	0.515	93	89	80	72
B	0.428	0.367	0.325	0.273	0.226	86	76	64	53
C	0.440	0.408	0.390	0.351	0.318	93	89	80	72
D	0.078	0.068	0.061	0.052	0.044	87	78	66	56
E	0.562	0.521	0.498	0.447	0.405	93	89	80	72
F	0.165	0.142	0.126	0.106	0.088	86	76	64	53
					平均	90	83	72	63

[0074]

[A table 24]

条件Ｎｏ：２ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	１４	２８	3	7	１４	２８
A	0.713	0.707	0.697	0.689	0.689	99	98	97	97
B	0.425	0.412	0.402	0.388	0.383	97	94	91	90
C	0.440	0.436	0.429	0.425	0.425	99	98	97	97
D	0.078	0.076	0.074	0.072	0.071	97	95	92	91
E	0.561	0.556	0.548	0.542	0.542	99	98	97	97
F	0.164	0.159	0.155	0.150	0.148	97	95	91	90
					平均	98	96	94	94

[0075]

[A table 25]

条件Ｎｏ：２ｂ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.717	0.691	0.675	0.637	0.622	96	94	89	87
B	0.423	0.399	0.383	0.365	0.346	94	91	86	82
C	0.442	0.426	0.416	0.393	0.383	96	94	89	87
D	0.077	0.073	0.071	0.067	0.064	95	91	87	83
E	0.564	0.543	0.531	0.501	0.489	96	94	89	87
F	0.163	0.154	0.148	0.141	0.134	94	91	87	82
					平均	95	93	89	85

[0076]

[A table 26]

条件Ｎｏ：３ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.716	0.717	0.708	0.705	0.697	100	99	98	97
B	0.420	0.423	0.412	0.396	0.386	101	98	94	92
C	0.441	0.442	0.436	0.434	0.429	100	99	98	97
D	0.077	0.077	0.076	0.073	0.071	101	98	95	92
E	0.563	0.564	0.557	0.554	0.548	100	99	98	97
F	0.162	0.163	0.159	0.153	0.149	101	98	94	92
					平均	101	99	96	95

[0077]

[A table 27]

条件Ｎｏ：３ｂ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.711	0.715	0.691	0.675	0.660	101	97	95	93
B	0.428	0.404	0.389	0.378	0.365	94	91	88	85
C	0.438	0.440	0.426	0.416	0.407	101	97	95	93
D	0.078	0.074	0.072	0.070	0.067	95	91	89	86
E	0.559	0.562	0.543	0.531	0.519	101	97	95	93
F	0.165	0.156	0.150	0.146	0.141	95	91	88	85
					平均	98	94	92	89

[0078]

[A table 28]

条件Ｎｏ：４ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.716	0.711	0.713	0.706	0.688	99	100	99	96
B	0.423	0.425	0.404	0.402	0.394	101	96	95	93
C	0.441	0.438	0.440	0.435	0.424	99	100	99	96
D	0.077	0.078	0.074	0.074	0.072	101	96	95	94
E	0.563	0.559	0.561	0.555	0.541	99	100	99	96
F	0.163	0.164	0.156	0.155	0.152	101	96	95	93
					平均	100	98	97	95

[0079]

[A table 29]

条件Ｎｏ：４ｂ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.712	0.711	0.698	0.680	0.672	100	98	96	94
B	0.420	0.396	0.386	0.378	0.367	94	92	90	88
C	0.439	0.438	0.430	0.419	0.414	100	98	96	94
D	0.077	0.073	0.071	0.070	0.068	95	92	91	88
E	0.560	0.559	0.549	0.535	0.528	100	98	96	94
F	0.162	0.153	0.149	0.146	0.142	94	92	90	88
					平均	97	95	93	91

[0080]
[A table 30]
条件Ｎｏ：５ａ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.715	0.716	0.702	0.707	0.694	100	98	99	97
B	0.428	0.415	0.420	0.404	0.388	97	98	94	91
C	0.440	0.441	0.433	0.436	0.428	100	98	99	97
D	0.078	0.076	0.077	0.074	0.072	97	98	95	91
E	0.562	0.563	0.552	0.556	0.546	100	98	99	97
F	0.165	0.160	0.162	0.156	0.150	97	98	95	91
					平均	99	98	97	94

[0081]
[A table 31]
条件Ｎｏ：５ｂ

被検者	ＣＡ１９－９濃度(U/ml) 保存期間(日)					安定度(%) 保存期間(日)			
	0	3	7	14	28	3	7	14	28
A	0.717	0.712	0.698	0.680	0.663	99	97	95	92
B	0.423	0.407	0.402	0.383	0.365	96	95	91	86
C	0.442	0.439	0.430	0.419	0.408	99	97	95	92
D	0.077	0.075	0.074	0.071	0.067	97	95	91	87
E	0.564	0.560	0.549	0.535	0.521	99	97	95	92
F	0.163	0.157	0.155	0.148	0.141	96	95	91	87
					平均	98	96	93	89

[0082] It is shown that <example 4> this example has the AFP concentration for which it asked by the approach of this invention, and the AFP concentration by the conventional approach in a good correlation.
1. From five creation volunteers (subject G-K) of standard AFP addition blood support support, blood 1.8mL was extracted, it divided [0.9mLx2], and 100microL, in addition standard AFP addition blood were prepared for the standard AFP solution (400 ng/mL) of a "SUFI alite AFP control set" to one of these. 100micro of standard AFP addition blood was dropped at the filter paper (BFC180, Watt Mann, Inc. make) L times, it dried at the room temperature (25**2 degrees C) for 1 hour, and standard AFP addition blood support support ** was created. Similarly, 0.9ml of blood of the method of other 1 was dropped and dried at the filter paper, and blood support support ** was created.
[0083] 2. Like the extract approach of an extract and measurement example 1 publication, the extract was prepared, respectively from standard AFP addition blood support support ** and blood support support **, and the AFP concentration in an extract was measured. Those results were shown in a table 32.
[0084]
[A table 32]

被検者	抽出液中のＡＦＰ濃度(ｎｇ／ｍｌ) 標準ＡＦＰ添加血液担持担体①（Ａ）	標準ＡＦＰ添加血液担持担体②（Ｂ）	Ｂ－Ａ	抽出率 (Ｂ－Ａ)／４０
G	０．０８６	０．８７６	０．７９０	０．０１９８
H	０．０４３	０．８４１	０．７９８	０．０２００
I	０．０２８	０．８３４	０．８０６	０．０２０２
J	０．０３４	０．８２９	０．７９５	０．０１９９
K	０．０６５	０．８６５	０．８００	０．０２００
平　均	０．０５１	０．８４９	０．７９８	０．０１９９

[0085] 3. Extractability was computed from the degree type from the measured value shown in the menue 32 of extractability. Those results were shown in a table 32. The average of the extractability in five persons' blood was set up as extractability (0.0199) at the time of creating and extracting on these conditions.
Extractability = (B-A) / CA: AFP concentration C:40 ng/mL in the extract prepared from the AFP concentration B:standard AFP (400 ng/mL) addition blood support support in the extract prepared from blood support support ** (the added amount of AFP)
[0086] 4. It collected blood from 20 names including the blood collecting hepatic-carcinoma patient. Blood collecting was carried out by the conventional approach (it extracts 2 or more mLs of whole blood from an elbow culmination vein using the syringe for blood collecting) from the example 1 written approach (from a fingertip to blood collecting), and the elbow culmination vein. After putting the whole blood extracted from the elbow culmination vein at a room temperature for 1 hour or more, cooling centrifugal [of it] was carried out for 1500 G or 10 minutes with the refrigerated centrifuge, and it isolated the supernatant liquid (blood serum) part preparatively further.
[0087] 5. Blood support support (blood desiccation filter paper) was created like the approach of creation example 1 publication of blood support support (blood desiccation filter paper). The drying time was made into the 1 same hour as the case of extractability setting out.
[0088] 6. Extract and AFP density measurement were carried out by the approach same about an extract and quantum blood support support as the case of extractability setting out. It measured the condition as the description which is "SUFI alite AFP" of example 1 publication, and was attached to the measurement reagent on the other hand about the blood serum extracted and separated by the conventional approach (amount of specimens 10microL).
[0089] 7. AFP concentration in the extract prepared from the decision blood support support of the AFP concentration in blood was **(ed) by extractability (0.0199), and it asked for the AFP concentration in blood. The concentration of AFP in the blood serum for which it asked by the conventional approach, and the AFP concentration in the blood for which it asked by the approach of this invention were shown in a table 33. Moreover, the correlation diagram of the AFP concentration by the approach of this invention and the AFP concentration by the conventional method was shown in drawing 1 using these values. The AFP concentration in the blood serum in a conventional method and the AFP concentration in blood by the approach of this invention showed good functionality so that drawing 1 might show. A formula shows a correlation type (X: AFP concentration in a conventional method, AFP concentration in the approach of Y:this invention) among drawing 1 , and R shows a correlation coefficient.
[0090]
[A table 33]

単位：ｎｇ／ｍＬ

被検者	従来法による ＡＦＰ濃度	本発明の定量方法 抽出液中のＡＦＰ濃度	血液中のＡＦＰ濃度
1	4．1	0．072	3．62
2	18．6	0．409	20．57
3	25．7	0．471	23．67
4	90．7	1．730	86．93
5	63．0	1．360	68．34
6	34．8	0．693	34．82
7	52．3	1．046	52．56
8	5．7	0．132	6．63
9	17．4	0．346	17．39
10	10．5	0．202	10．15
11	1．4	0．036	1．81
12	2．5	0．043	2．16
13	3．8	0．084	4．22
14	8．4	0．187	9．40
15	7．6	0．132	6．63
16	15．2	0．314	15．78
17	69．4	1．528	76．78
18	42．5	0．910	45．73
19	6．2	0．104	5．23
20	2．4	0．058	2．91

[0091] It is shown that <example 5> this example has the CEA concentration for which it asked by the approach of this invention, and the CEA concentration by the conventional approach in a good correlation.
1. From five creation volunteers (subject G-K) of standard CEA addition blood support support, blood 1.8mL was extracted, it divided [0.9mLx2], and 100microL, in addition standard CEA addition blood (0 ng/mL, 150 ng/mL) were prepared for the standard CEA solution (0 or 150 ng/mL) of a "SUFI alite CEA control set" to one of these, respectively. 100micro (150 ng/mL) of standard CEA addition blood was dropped at the filter paper (BFC180, Watt Mann, Inc. make) L times, it dried at the room temperature (25**2 degrees C) for 1 hour, and standard CEA addition blood support support ** was created. Similarly, 100micro (0 ng/mL) of blood L of the method of other 1 was dropped and dried at the filter paper, and blood support support ** was created.
[0092] 2. Like the extract approach of an extract and measurement example 2 publication, the extract was prepared, respectively from standard CEA addition blood support support ** and blood support support **, and the CEA concentration in an extract was measured. Those results were shown in a table 34.
[0093]
[A table 34]

被検者	抽出液中のＣＥＡ濃度(ｎｇ／ｍｌ) 標準ＣＥＡ添加血液担持担体① (A)	標準ＣＥＡ添加血液担持担体② (B)	B－A	抽出率 (B－A)／15
G	0．076	0．375	0．299	0．0199
H	0．033	0．335	0．302	0．0201
I	0．041	0．338	0．297	0．0198
J	0．084	0．382	0．298	0．0199
K	0．024	0．324	0．300	0．0200
平均	0．052	0．351	0．299	0．0199

[0094] 3. Extractability was computed from the degree type from the measured value shown in the menue 34 of extractability. Those results were shown in a table 34. The average of the extractability in five persons' blood was set up as extractability (0.0199) at the time of creating and extracting on these conditions.
Extractability = (B-A) / CA: CEA concentration C:15 ng/mL in the extract prepared from the CEA concentration B:standard CEA (150 ng/mL) addition blood support support in the extract prepared from blood support support ** (the added amount of CEA)
[0095] 4. It collected blood from 20 names including the blood collecting colon cancer patient. Blood collecting was carried out by the conventional approach (it extracts 2 or more mLs of whole blood from an elbow culmination vein using the syringe for blood collecting) from the example 1 written approach (from a fingertip to blood collecting), and the elbow culmination vein. After putting the whole blood extracted from the elbow

culmination vein at a room temperature for 1 hour or more, cooling centrifugal [of it] was carried out for 1500 G or 10 minutes with the refrigerated centrifuge, and it isolated the supernatant liquid (blood serum) part preparatively further.
[0096] 5. Blood support support (blood desiccation filter paper) was created like the approach of creation example 1 publication of blood support support (blood desiccation filter paper). The drying time was made into the 1 same hour as the case of extractability setting out.
[0097] 6. Extract and CEA density measurement were carried out by the approach same about an extract and quantum blood support support as the case of extractability setting out. It measured the condition as the description which is "SUFI alite CEA" of example 2 publication, and was attached to the measurement reagent on the other hand about the blood serum extracted and separated by the conventional approach (amount of specimens 40microL).
[0098] 7. CEA concentration in the extract prepared from the decision blood support support of the CEA concentration in blood was **(ed) by extractability (0.0199), and it asked for the CEA concentration in blood. The concentration of CEA in the blood serum for which it asked by the conventional approach, and the CEA concentration in the blood for which it asked by the approach of this invention were shown in a table 35. Moreover, the correlation diagram of the CEA concentration by the approach of this invention and the CEA concentration by the conventional method was shown in drawing 2 using these values. The CEA concentration in the blood serum in a conventional method and the CEA concentration in blood by the approach of this invention showed good functionality so that drawing 2 might show. A formula shows a correlation type (X: CEA concentration in a conventional method, CEA concentration in the approach of Y:this invention) among drawing 2 , and R shows a correlation coefficient.
[0099]
[A table 35]

単位：ｎｇ／ｍＬ

被検者	従来法によるＣＥＡ濃度	本発明の定量方法 抽出液中のＣＥＡ濃度	血液中のＣＥＡ濃度
1	0．8	0．002	0．10
2	2．3	0．042	2．11
3	5．6	0．121	6．08
4	8．4	0．173	8．69
5	82．1	1．630	81．91
6	20．8	0．403	20．25
7	69．7	1．346	67．64
8	0．6	0．011	0．55
9	3．4	0．071	3．57
10	1．8	0．035	1．76
11	1．4	0．024	1．21
12	3．6	0．073	3．67
13	1．1	0．021	1．06
14	4．3	0．087	4．37
15	2．8	0．051	2．56
16	6．3	0．122	6．13
17	1．9	0．041	2．06
18	38．7	0．809	40．65
19	2．3	0．045	2．25
20	4．8	0．088	4．41

[0100] It is shown that <example 6> this example has 19 to CA9 concentration for which it asked by the approach of this invention, and 19 to CA9 concentration by the conventional approach in a good correlation.
1. From five creation volunteers (subject G-K) of Standard C A19-9 addition blood support support, blood 1.8mL was extracted, it divided [0.9mLx2], and 100microL, in addition Standard C A19-9 addition blood were prepared for Standard C A19-9 solution (0 or 200 U/mL) of a "SUFI alite CA19-9 control set" to one of these, respectively. 100micro (200 U/mL) of Standard C A19-9 addition blood was dropped at the filter paper (BFC180, Watt Mann, Inc. make) L times, it dried at the room temperature (25**2 degrees C) for 1 hour, and Standard C A19-9 addition blood support support ** was created. Similarly, 100micro (0 U/mL) of blood L of the method of other 1 was dropped and dried at the filter paper, and blood support support ** was created.
[0101] 2. Like the extract approach of an extract and measurement example 3 publication, the extract was

prepared, respectively from Standard C A19-9 addition blood support support ** and blood support support **, and 19 to CA9 concentration in an extract was measured. Those results were shown in a table 36.

[0102]

[A table 36]

被検者	抽出液中のCA19-9濃度(U/ml) 標準CA19-9添加血液担持担体① (A)	標準CA19-9添加血液担持担体② (B)	B-A	抽出率 (B-A)/20
G	0.804	1.211	0.407	0.0204
H	0.326	0.732	0.406	0.0203
I	0.081	0.493	0.412	0.0206
J	0.160	0.572	0.412	0.0206
K	0.042	0.448	0.406	0.0203
平均	0.283	0.691	0.409	0.0204

[0103] 3. Extractability was computed from the degree type from the measured value shown in the menue 36 of extractability. Those results were shown in a table 36. The average of the extractability in five persons' blood was set up as extractability (0.0204) at the time of creating and extracting on these conditions.

extractability = (B-A) -- CA 19-9 in the extract prepared from /CA:blood support support ** -- CA19-9 concentration C:20 U/mL (19 to CA9 added amount) in the extract prepared from concentration B:Standard C A19-9 (200 U/mL) addition blood support support

[0104] 4. It collected blood from 20 names including the blood collecting pancreas cancer patient. Blood collecting was carried out by the conventional approach (it extracts 2 or more mLs of whole blood from an elbow culmination vein using the syringe for blood collecting) from the example 1 written approach (from a fingertip to blood collecting), and the elbow culmination vein. After putting the whole blood extracted from the elbow culmination vein at a room temperature for 1 hour or more, cooling centrifugal [of it] was carried out for 1500 G or 10 minutes with the refrigerated centrifuge, and it isolated the supernatant liquid (blood serum) part preparatively further.

[0105] 5. Blood support support (blood desiccation filter paper) was created like the approach of creation example 1 publication of blood support support (blood desiccation filter paper). The drying time was made into the 1 same hour as the case of extractability setting out.

[0106] 6. Extract and 19 to CA9 density measurement were carried out by the approach same about an extract and quantum blood support support as the case of extractability setting out. It measured the condition as the description which is "SUFI alite CA 19-9" of example 3 publication, and was attached to the measurement reagent on the other hand about the blood serum extracted and separated by the conventional approach (amount of specimens 10microL).

[0107] 7. 19 to CA9 concentration in the extract prepared from the decision blood support support of 19 to CA9 concentration in blood was **(ed) by extractability (0.0199), and it asked for 19 to CA9 concentration in blood. The concentration of CA 19-9 in the blood serum for which it asked by the conventional approach, and 19 to CA9 concentration in the blood for which it asked by the approach of this invention were shown in a table 37. Moreover, the correlation diagram of 19 to CA9 concentration by the approach of this invention and 19 to CA9 concentration by the conventional method was shown in drawing 3 using these values. 19 to CA9 concentration in the blood serum in a conventional method and 19 to CA9 in blood concentration by the approach of this invention showed good functionality so that drawing 3 might show. A formula shows a correlation type (X: 19 to CA9 concentration in a conventional method, 19 to CA9 concentration in the approach of Y:this invention) among drawing 2 , and R shows a correlation coefficient.

[0108]

[A table 37]

単位：U／ｍＬ

被検者	従来法による CA19-9濃度	本発明の定量方法 抽出液中のCA19-9濃度	血液中のCA19-9濃度
1	43.5	1.010	49.51
2	20.4	0.531	26.03
3	1.0	0.022	1.08
4	0.8	0.013	0.64
5	53.7	1.030	50.49
6	12.0	0.317	15.54
7	5.6	0.116	5.69
8	125.3	2.345	114.95
9	7.9	0.071	3.48
10	4.8	0.092	4.51
11	23.5	0.421	20.64
12	38.9	0.773	37.89
13	65.2	1.445	70.83
14	13.7	0.216	10.59
15	48.6	1.123	55.05
16	95.0	2.090	102.45
17	186.9	4.004	196.27
18	21.6	0.509	24.95
19	4.8	0.094	4.61
20	15.7	0.287	14.07

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is a graph showing correlation with the AFP concentration in the blood serum by the conventional approach, and the AFP concentration in the blood by the approach of this invention.
[Drawing 2] It is a graph showing correlation with the CEA concentration in the blood serum by the conventional approach, and the CEA concentration in the blood by the approach of this invention.
[Drawing 3] It is a graph showing correlation with 19 to CA9 concentration in the blood serum by the conventional approach, and 19 to CA9 concentration in the blood by the approach of this invention.

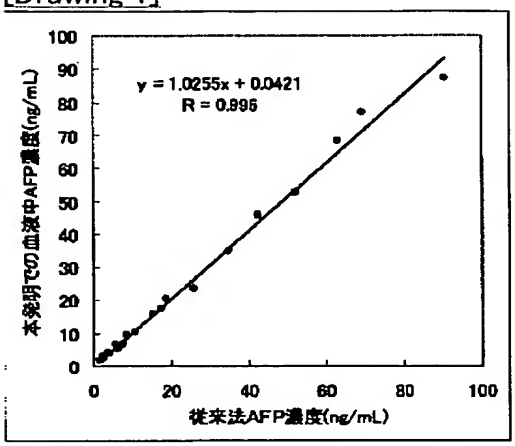
[Translation done.]

* NOTICES *

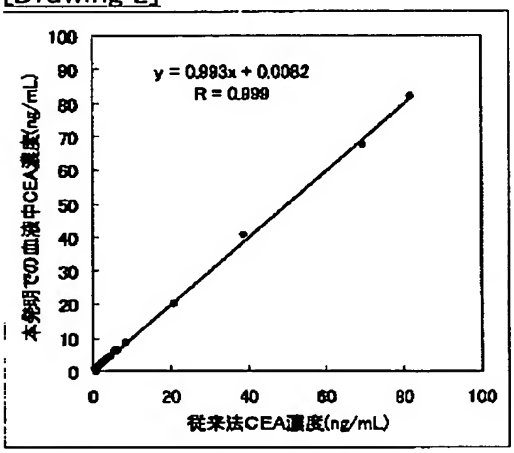
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Drawing 2]



[Drawing 3]